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PAPERS

READ AT

The Royal Institute of British Architects,

SESSION 1856—57.

USUI CIVIUM, DECORI URBIUM.

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BRIEF MEMOIR OF THE LATE COMMENDATORE CANINA, HONORARY AND CORRESPONDING MEMBER OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

By T. L. Donaldson, Hon. Sec. Foreign Correspondence.

Read at the Opening Meeting of the Session, 1856-7, of that Society, November 3rd, 1856.

When I undertook to bring before you the important subject of the description of the works, now carrying on from the designs of Mr. Salvin and the Signor Canina at Alnwick Castle, the seat of His Grace the Duke of Northumberland, I little thought that our feelings were to be saddened by the intelligence that we have recently received of the decease of the Commendatore, our Honorary and Corresponding Member, who has taken so great a part in these interesting alterations, and under the influence of whose living spirit I thought that my words this evening would be uttered. But he is no more! having died of congestion of the brain at Florence, on the 17th of last month, as he was returning to Rome after a lengthened stay in England.* A considerable portion of his sojourn here he had, by the special invitation of the Duke, passed within the hospitable walls of Alnwick, which he had visited in order to put into operation certain works for the internal decorations, that he had designed for His Grace; and the last three weeks he had lived under my own roof as my old friend and guest. Just before he left my house he put into my hand a letter, of which the following is a translation:—

Bolton Gardens, Russell Square, 22nd September, 1856.

To T. L. Donaldson, Esq., Hon. Secretary of Foreign Correspondence to the Royal Institute of British Architects.

Most valued Sir, and beloved Friend,

From your own house I have to make the request that, at the first meeting which will be held by the Royal Institute of British Architects, you will present vols. V and VI of my work upon the Antique Edifices of Rome and its Campagna, of which publication relating to the edifices of the city the first four vols. have already been transmitted, and which together complete the entire work. This, not only by its fulness, but also by the importance of the monuments illustrated therein in all their architecture may, perhaps, deserve distinct consideration, and that especially from being entirely executed by a not lazy artist, who only seeks to promote the study and progress of the best and most improved kind of architecture. Particularly anxious to act with the greatest possible concurrence in the views proposed by His Grace the Duke of Northumberland, and animated by the same desire, I beg to submit to the judgment of your distinguished Institute some of the principal perspective drawings of the internal decorations, which His Grace is about to have executed in his castle at Alnwick. He has, in pursuance of this intention, arranged that they should be sent to be exhibited at one of the first meetings, accompanied by a description drawn up by myself. These drawings have been made in a masterly manner by the architect Montiroli, whom I recommend to your artistic Institution. You were so good as to come to Alnwick in August last, and to examine care-

* By a letter from Rome, addressed by our Honorary and Corresponding Member Mons. Hittorff, to the Institute of France, "that the Commendatore had no one near him, no friend nor companion, at the hotel at the time of his death."

fully the proposed internal decorations. You will therefore be able, where necessary, to give more minute particulars of the work, as will also my most honoured friend Professor Cockerell, who accompanied you on that occasion. My object in the exhibition of these drawings is not limited to the wish of merely making known what has been decided to be carried out at Alnwick Castle, but to promote a more extensive application in England of that kind of noble decoration, which was the result of the studies made by our masters at the revival of the fine arts, in Italy especially, upon the most ancient monuments of Rome; from which circumstance this style became at once noble, and adapted to modern uses. To this general scope and purpose are particularly directed the intentions of His Grace, and worthy of consideration is the following paragraph in the last letter, which I received from Alnwick, dated yesterday: "*I pray you to present my best compliments to Professors Cockerell and Donaldson, and to assure them how sensible I am of their kindness in taking such a deep interest in this subject which I hold to be of national importance, that is to promote a more extensive system of artistic instruction in England in that style of decoration.*" The nation, as regards architecture, being well represented by the distinguished professional men composing the Royal Institute of British Architects, that body will be able authoritatively to promote the noble intentions of the Duke, as will also other influential personages already known by their patronage of the fine arts. I seize with pleasure the opportunity thus offered to me of renewing the expression of the sentiments of deep esteem and consideration, which I entertain for the members of the Institute, to whom I beg you will present them, and believe me, my dear sir,

Your most devoted friend and servant,

L. Canina.

This letter shows the generous motives by which he was animated; a sincere respect for this Institute, to which he was anxious to present a complete series of his works—the desire to communicate to it as representing the arts in this country, a statement of the principles which guided him in carrying out the views of the princely owner of Alnwick—and that deep love of architecture which was one of the moving principles of his existence, which he wished to diffuse wherever he went, and as widely as his influence existed.

Instead, however, of immediately proceeding to the subject announced for this evening's meeting, I venture to think that I shall better consult the feelings of the members by previously offering a tribute of respect to our departed friend and colleague, the Commendatore, by submitting to your consideration a brief notice of that distinguished and remarkable man. I offer it not as an eulogy; for what eulogy can he require, who has been honoured by the highest distinction that this Institute has to bestow? the Royal Gold Medal. I offer it not as a vindication, for what vindication can be necessary for the literary and artistic character of an author whose best justification rests in the important works that bear his name? It is only as a hurried and therefore imperfect, but I trust not inaccurate sketch, that I venture to claim your attention for a few minutes to some observations, which I have endeavoured to keep untinctured by the indulgent predilection of too partial friendship.

I am not at this moment in possession of any authentic details connected with his early life and studies.* I can only relate what I learned from himself casually from time to time while we were together, and my own impressions derived from his works. He told me, that at the time I was in Rome pursuing my studies, between 1818 and 1822, he was engaged with Vasi the eminent publisher,

* Nagler, in the Künstler Lexicon, merely notices Canina as a Professor of the Academy at Turin, quotes his first work alone, and mentions that Pope Gregory conferred upon him the order of the Spur, now suppressed.

who wrote various guides of Roman antiquities aud of Rome itself. The name of Vasi is justly celebrated, as well from his Itinerary, as from being attached to very large aud fine views of St. Peter's at Rome, which convey better than any other representations of that stupendous monument, an adequate idea of its vastness and majesty. The drawing and execution of these plates are perfect. The first important work of Canina, as an author, appears to be his History of Ancient Architecture, divided into the three series of Egyptian, Greek and Roman; the second edition of which consists of three folio volumes of 705 plates, and 9 volumes of text in 8vo. In this collection he presents the reader with illustratious of all the then known remarkable monuments of antiquity, derived from every authentic source with remarkable patience and judgment; and the text forms a most valuable resumé of all that has been written by various ancient authors upon this special subject. It thus affords a very complete source of reference to those whose studies are turned upon the history of ancient monuments.

About the year 1842, he visited Turin, where he remained three months, and being invited to give his ideas upon a proposed new church to be erected on the site of that of St. John iu that city, he availed himself of the opportunity to develope at considerable length his opinions of the proper form of a Christian church, which he conceived to be that of the early Christian Basilica, like that of St. Paul's without the walls at Rome; not that he intended to adopt the type throughout every minute detail, but to assume that form as the basis. Moved by this great predilection of his, the Signor Canina, under the auspices of H. M. Carlo Alberto, King of Sardinia, published in 1843 a folio volume, which reviews the history, distinctive form, properties and decorations of the ancient Roman Basilicas. He discusses the various theories to which the obscure description of Vitruvius has given rise; he then reviews in detail the several examples of the early Basilicas, analysing the several parts with their various uses, and not confining his illustrations to Rome, extends his enquiries to the individual erections of Constantinople, Ravenna, Aix-la-Chapelle (anc^{t} Aquis-Granum), Pavia, Milan, Palermo, Venice; and at the end he illustrates in several plates his own application of the principles, which he had discussed to the proposed Church of St. John, for which he had prepared a design in the Christian Basilica style with a large peristyled court in front.

I must confess, that valuable as I consider his learned researches on the subject to be, I cannot concur with him in his conclusions; for I do not consider the Christian Basilica a form adapted to a church, as it is meagre in its effect, producing an impression not at all equivalent to its size and cost. In the course of his text, he alludes to a very curious authority for the disposition of a church at that time, and the names of the several parts; it is St. Paulinus, who in his poems and in his letters to Severus, refers most frequently to these matters, and particularly describes the Basilica of S. Felice at Nola, of which city he was bishop, and the church of which he built A.D. 402 (Paulinus, Poemata, Natalis decimus).

Canina next devoted his studies to the immediate edifices of ancient Rome and the Campagna, and published four vols. of plates illustrating the former and two devoted to the Campagna, which were followed by a folio volume of type, as a topographical Exposition of ancient Rome. He then entered upon the investigation of the important monuments of the Roman Forum, a subject which had been distracted by the contentions of the rival systems of French, German and Italian antiquaries, and which had caused a strife that set all the archæologists by the ears. The drawings of this admirable production shew more of purity of style, profounder knowledge of the disposition of ancient monuments, and larger ideas, than any previous one of our author. He differs materially from the German school in his conclusions, making the length of the Roman Forum extend from the Capitol towards the Coliseum. The text accompanying these plates is a most valuable collection of the

authorities who have treated on the subject. His next work was a topographical plan of the Campagna of Rome, full of profound research. He next turned his attention to Jerusalem, in a folio volume, entitled "Researches upon the Architecture of the Ancient Jews and of the Temple of Jerusalem," and then resumed his Roman studies by a folio work of 53 plates upon ancient Tusculum, detailing the Villas, the Forum, the Theatre, and other antiquities which still remain upon that classic site; and always by his descriptions throwing new light upon the manners and customs of the ancients in reference to their edifices. This work was undertaken under the auspices of the Queen Dowager of Sardinia, to whose family Tusculum belongs.

But his researches were now to take in a more remote epoch, and to seek for illustrations in a field, which has since, within the last twenty years, been so fruitful of evidences of the history of the earlier inhabitants of Italy; and which have brought to light antiquities, such as cities, city walls, tombs, vases and other curious objects, dating prior to the foundation of Rome itself. The City of Veü has its folio volume of 45 plates, meant only for private distribution, and prepared at the expense of the Dowager Queen of Sardinia already alluded to. Ancient maritime Etruria is described and demonstrated, with its monuments, in four folio volumes and 136 plates. These works introduce us to arts, buildings, and other monuments revealing influences of Greek origin, and developing a school anterior to the earliest of any of the Roman buildings. Our indefatigable author next published a folio volume of 40 plates upon domestic architecture, applying the most graceful forms of all ancient people to modern uses. Thus carrying out his great endeavour to throw as much of the ancient taste as he possibly could into the various productions of modern times, he sought to influence the mechanical arts, so as to lead to a revival of antique forms, dispositions and proportions.

His last, and it may truly be called, his "Opus Magnum," consists of two folio volumes, containing the results of his excavations on the old Via Appia for a distance of six miles from the walls of Rome to Boville, with the announced intention of soon continuing his publication from Boville to Ariccia, and which doubtless he would have fulfilled, had he been spared to complete his grand scheme. Many of you will recall the vivid manner, in which our Vice-President Mr. Tite, on his return from Rome in 1855, described at one of our meetings the impressions produced on his mind, when, in company with Canina, he visited the successful results of his labours on the Via Appia. The tombs, the paved road, the mile stones, the villas, the Circi, the amphitheatres, the fora, and other important edifices, which the encumbered ruins, piled upon pile, were made to reveal to the labour and intelligence of our friend, of a scale little inferior to those, so well known to all of us, in Rome; not less rich in decoration, nor less novel in design—a mass of fresh inscriptions to illustrate still further ancient customs and ancient history. Such are the subjects of these two volumes, among the most important of modern times. The same plate shews in one part the shapeless masses of brick or tufo work, which were above the surface, or the mounds formed of overthrown fragments. In the other part of the sheet are revived the several monuments restored by the intelligence of the author and his assistants, with their marbles, their columns, their sculptures, and their domes; and one seizes, as by inspiration, a conception of glories and splendour, of which the dreary Campagna had hitherto seemed to present no idea.

I have alluded thus cursorily to twenty-four folios of plates, and to ten or twelve of closely written 8vo. volumes of text; but these are not the only fruits of his laborious researches and fertile imagination. He published an enlarged supplementary edition of Desgodetz, and wrote numerous very important papers, which are inserted in the "Annali dell' Instituto Archeologico" of Rome. I placed before him, while in England, my series of illustrations of antique medals, and he then mentioned his intention to compile a work on the architectural medals which represent the monuments of

classic Rome; a subject which he had hitherto not treated with the weight that it deserved, his representations of medals, attached to his plates, being very loosely, and in some instances, very inaccurately rendered by his draughtsmen. He had it also in contemplation to collect the materials for a treatise on the ornamental parts of the domestic architecture of the ancients. Some of the fragments he had disinterred on the Via Appia, an accurate study of the paintings of Pompeii, with their fantastic representations of villas, alcoves, and slightly proportioned columns and other similar airy features, and the frescoes of the Thermæ at Rome, with various remains in the Roman Museums on the bas-reliefs, and the contemplation of the component parts of the candelabra that Piranesi had put together, compiled from antique fragments, produced the conviction on his mind, that the Romans allowed a licence of form and proportion in their domestic art, quite distinct from the severer rules of monumental architecture, nay, opposed to it. He conceived that from these "indicia" he could construct a perfect system of domestic decoration, at once light, plastic, graceful, and reasonable; and it was a great source of delight to him actually to find such a system constructively carried out in the Crystal Palace at Sydenham. Much as he disapproved, and with justice, of the total absence of artistic taste evidenced in its design, yet he visited it twice, with the express object of more definitely realizing in his mind the ideas which had hitherto been floating in it on that subject, without being able to conceive a precise natural mode of structural application, which the Crystal Palace seemed to offer. The development of this notion would have been a curious exercise for his ingenious mind, and we might have been taught by it to set greater store by the endless facilities which iron in its application to edifices affords, relieving us from the shackles of severe art to revel, not unreasonably, yet freely and untrammelled, in all the flights and fancies that the most poetic imagination could conceive, and justified by the precedent which antiquity itself offered.

The Commendatore Canina had travelled much throughout Europe, and had studied on the sites themselves the monuments of Sicily and Greece proper. His recent visit to England was the second that he had made to this country. His researches and labours were appreciated by many Princes and Sovereigns, and he was decorated with a profusion of Orders of various countries. But the distinction which he valued most was the position he held as Director of the Museum of the Capitol, and the title of Commendatore, which ranked him among the forty Nobles of Rome. This gave him just pride, as did also the Royal Gold Medal conferred upon him by this Institute, in 1849, with the approval of her Majesty and Prince Albert.

Like Piranesi and other Roman authors, he had the whole of the branches of publication carried out in his own house, in the Via Gregoriana. The type of his text was composed and carried through the press under his own roof; one room or more was occupied by draughtsmen and engravers; another contained the presses by which the engravings were printed; and, with the exception of one or two works, all were prepared and published at his own expense.

He was of early habits, rising, while in England, at five or six o'clock in the morning, and immediately setting himself to work, pen in hand. He was punctilious in his correspondence and obliging in his disposition. He undertook the engagement for Alnwick from no sordid object or intention of gain; but merely, as he took a formal occasion to assure Mr. Cockerell and myself, with the express and declared intention, full of generous disinterestedness, to carry out the wishes of the Duke of Northumberland for the promotion of art, and to do justice to his patron and friend the Cardinal Antonelli, by whom he was introduced to his Grace. He was very susceptible of criticism and opposition of opinion, and deeply resented the strictures of the German literati, who disputed his scholarship, and the critiques of the French, who called in question his taste. He was not free from the superstitious sentiments common to many of his countrymen, and, from an intuitive dread of

consequences, would never allow his portrait to be painted nor his bust to be modelled. By a friendly stratagem I induced him to visit Messrs. Maull and Polyblank's photographic establishment, and after much persuasion prevailed upon him to permit his likeness to be taken, as one of the notabilities of the day. But it did violence to his feelings, and to avert the "malocchio" he arranged (as he thought unobservedly) the fingers of his right hand, as a charm against the evil consequence that he feared; a presentiment which the sad event of his death so soon after almost seemed to realise. The photograph, which I have the honour to present, faithfully represents the serious character and deep thoughtfulness of the scholar; but his expressive features, however, in moments of familiar and social relaxation, were often lighted up by a most pleasing smile.

His decease will produce a great void in Rome, where his acquirements and judgment were fully valued. His opinion was a high authority on all matters of classic archæology, and many an artist recognised in him a judicious adviser and patron. He was naturally reserved, and slow to form friendships, being distrustful of the depth of quick attachments; but, when once a friend, he continued so firmly and warmly, and thought no personal exertion or sacrifice too great to serve those he valued.

He was truly a giant in the archæological and architectural literature of classic antiquity; and however various may be the opinions of men upon his erudition and taste, all must agree, that he had great acuteness of perception on antiquarian subjects, and a very enlarged acquaintance with ancient art, for which he had the most supreme veneration, as also for the works of the masters of the XVth and XVIth centuries. Although occasionally influenced by certain deep prejudices, particularly in regard to Mediæval art, he has yet rendered essential service in the elucidation of the history of architecture. He has abridged the task of future labourers in that field of research, and left a body of information and instruction in his numerous tomes far beyond that produced by any other previous scholar. It would be difficult to find any more earnestly and disinterestedly devoted to the highest and noblest principles of our art.

It is a striking and touching coincidence, that Canina and Braun, the leaders of the rival systems of the two schools of archæological research in Rome, the Italian and the German, should have died within a few weeks of each other, and thus left the field open to other, but it would be bold to say to abler or more zealous, minds.

SOME DESCRIPTION OF ALNWICK CASTLE, NORTHUMBERLAND,

THE SEAT OF HIS GRACE THE DUKE OF NORTHUMBERLAND, K.G.

Compiled from Materials furnished by A. Salvin, *Fellow, the* Commendatore Canina, *and other sources.*

By T. L. Donaldson, Hon. Sec. For. Cor.

Read at the Ordinary General Meetings of the Royal Institute of British Architects, November 3rd and 17th, 1856.

This important stronghold formed a species of frontier fortress between Scotland and England, being only at the distance of about 30 miles from the Scottish border, and lying within 4 miles of the sea coast; it therefore commanded the high road from one country to the other. It is placed on a plateau, partly natural and partly artificial, midway up the hill, which rises from the River Alne to the South. On the West side is the principal entrance with its barbican, affording access from Alnwick. This town is attached to the castle, and is itself surrounded by a strong wall, and entered by gates, one of which, an old one, still remains in tolerable preservation, the two others now standing being comparatively modern. The fortifications of the town in their present extension are attributed to the second Earl of Northumberland, the son of Hotspur, about 1434; but doubtless so important a place, and one exposed to the continued incursions of the hostile Scotch, and the not very scrupulous raids of the Borderers, must have been surrounded at an earlier date by a circumvallation or some degree of fortification to protect the inhabitants from surprise, and enable them to resist for a time an advancing host.

The Mediæval castles of Great Britain may be divided into four classes: The simple fortified tower (a tradition of the remoter periods and similar to the outposts sculptured on the Trajan column) not of any considerable size, and yet sufficiently large to receive a small body of warriors, and afford accommodation for their provisionment and their arms. These may have stood singly, as towers of observation, to watch and harass for a time an aggressive force, and may have been surrounded by a temporary ditch, or a space enclosed by a stockade to receive cattle at night, or those of the countrymen near, in case of attack. They thus formed places of shelter even to the peasantry in times of danger. Such a tower was most likely the earliest predecessor of Alnwick Castle.

A second class of castles consisted of a large square donjon or tower, like those of London, Rochester, Richmond in Yorkshire, Bamborough Castle, Newcastle, and others, usually attributed to our Norman invaders. These were divided into several storeys in height, and each storey distributed into one or more central halls, and several chambers and galleries gained in the thickness of the walls. A fortified curtain surrounded them, enclosing a considerable space, with intermediate towers, and one or two entrance gateways, with barbican, and postern, and salley gates. Some of these, as at Rochester and Newcastle, received considerable architectural decoration in the interior, the mouldings being carved in the doorways, chapel, and halls.

A third class of castle consists of a central group of distinct towers of considerable size, surrounding a middle court, united by curtain walls, and each tower more or less extensive, according to the distinctive purpose for which it was intended; as the entrance gate with its porter's rooms and marshall or constable's accommodation, and with the prisons. Another was appropriated to the baron; a third to the baroness communicating therewith; a fourth to the officers of the household; a fifth to guests; and another to the hall, kitchen, butteries, cellars, and offices for inferior retainers. The whole formed in itself a position of great strength, enabling the chief, his warriors and family, when the outworks were in possession of the enemy, still to hold out, until the means of

resistance or the patience of the besieged were exhausted. Of this class is Alnwick, as likewise Conway and Caernarvon, and the old Bastille at Paris. They were generally surrounded by extensive areas, like the previous class, consisting of what are called the outer or entrance Ballium or ward, middle Baily, and so on; but occasionally when attached to a town, as at Conway or in the case of the Bastille, these outer courts did not exist.

Our notice on castles in general should not stop here, and we may be permitted perhaps to notice cursorily another class, consisting of a large square or circular court, having a fortified entrance gateway flanked by towers, with circular towers at the angles or in the circumference of the precinct united by curtain walls, against which were attached within the court subordinated buildings for residence, and offices of all descriptions, and the whole castle surrounded by a fosse. Such is Barnwell Castle, near Oundle, in Northamptonshire, and Rothsay, in the Isle of Bute, N.B., both which are very interesting examples and deserve special study.

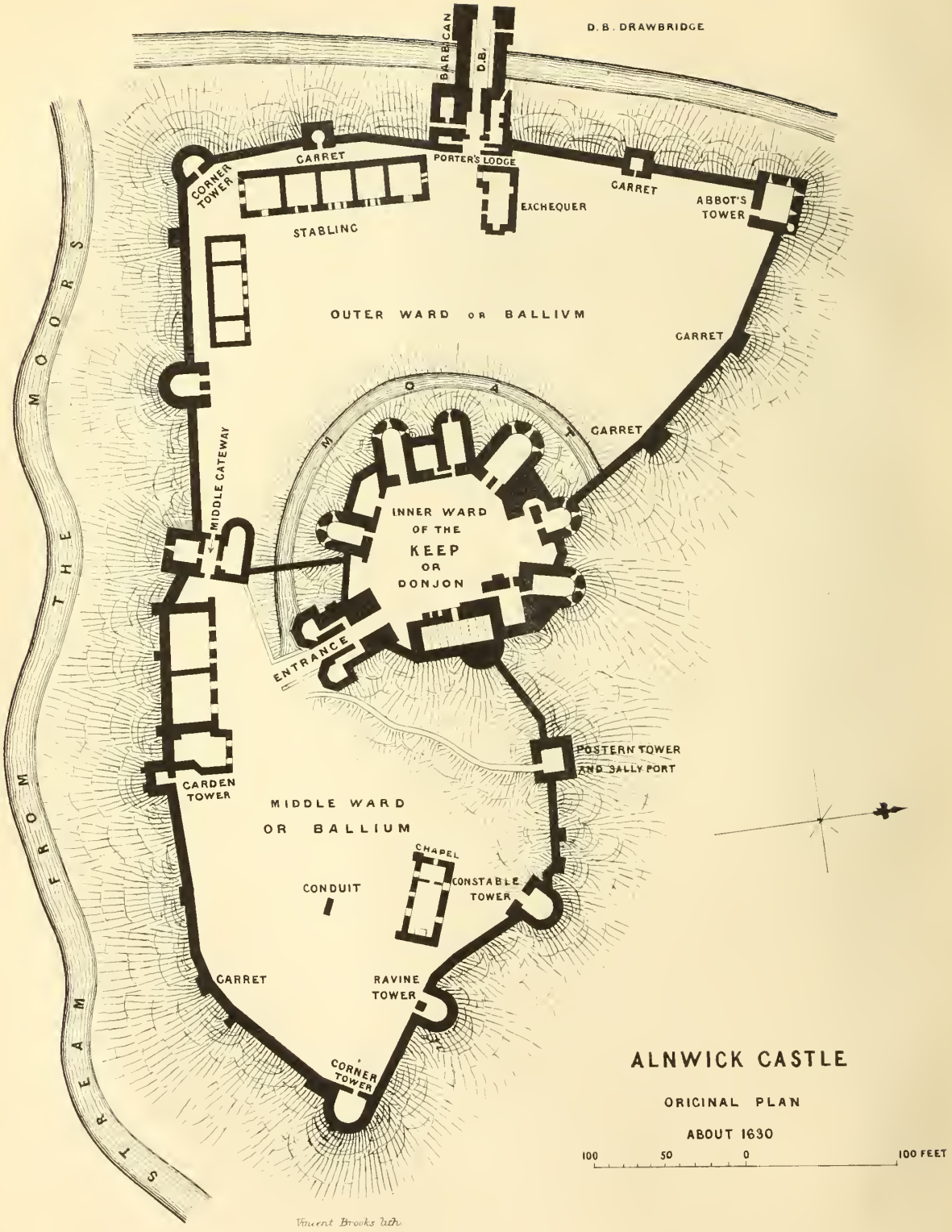
To resume, however, our history of Alnwick, for which purpose I avail myself of the elegant quarto volume, published by Charlotte Florentia, the present Dowager Duchess of Northumberland, illustrated by effective views, lithographed by Harding from her Grace's very clever drawings, and accompanied by text written by Archdeacon Singleton, which is the authority for the annals it records.

At the period of the Conquest, 1066, the Castle and Barony of Alnwick belonged to Gilbert Tyson, who was slain at the side of Harold. The Conqueror gave the granddaughter of Tyson in marriage to Ivo de Vesci, a Norman favourite, and the inheritance continued in the family till 1297, when it passed, in default of legitimate issue, to Anthony Bec, Bishop of Durham. The precise extent and features of the earliest castle under Tyson, it is impossible to ascertain; but it was enlarged by De Vesci, and it may be assumed, that it consisted generally of the parts now standing, varied from time to time as necessity or expediency required, and which we shall find involved changes in certain parts, though not so radical as to alter the general aspect.

The Castle consists of a central Keep, formed of a group of towers surrounding a court-yard about a hundred feet square inside. This keep is encircled by a considerable plot of open ground, divided into two large courts, both which served as "places d'armes" for exercising and manœuvring the troops, as we find drawn on the plans of about the middle of the 17th century, and probably in the outer one was a jousting ring and space for the tournaments, without doubt occasionally held here upon occasions of Royal visits. The whole contained about five acres within the walls, and was enclosed by a curtain wall fortified at distances by square and circular towers, with a principal barbican and entrance gate next the town, by which access was given to the interior of the fortress.

The Curtain is the construction of various periods, the earliest portions being considered to be those of De Vesci: and the courses, instead of being stepped up into horizontal courses, follow the varied surface of the ground, in curved and parallel lines, and generally there are no projecting footings to form the foundation. There are very obvious traces of the De Vesci walls quite distinct from those of his successors; and signs of reparations, alterations, and additions are apparent in various parts. The curtain wall did not at first entirely enclose the keep, one of whose sides to the N.E. next the river, at the part where there was a steep ascent, was exposed to the country; but after the report of Clarkson in 1556, who recommended the donjon being entirely disconnected and free from the park without, a portion of the outside ground was enclosed by constructing a curved curtain wall from the postern to the armourer's tower, and thus the keep was thereafter surrounded in its entire circuit by a continuous court. Originally, as we shall presently more particularly observe, the dwellings and offices for the retainers, and the subordinate domestic erections, were inside the outer and middle balliums or wards, but in more peaceful recent times they have been removed outside to give more space to the courts, and more freedom to the noble's dwelling.

TOWN OF ALNWICK.



ALNWICK CASTLE

ORIGINAL PLAN

ABOUT 1630

100 50 0 100 FEET

We will now take our survey of the circuit of the castle, and enumerate the several parts, with some short remarks on each division of the subject, following Clarkson's description of 1556, and certain plans now in existence, apparently made about the middle of the 17th century. It may here be mentioned, that we have some very remarkable records of the condition of the castle at certain fixed periods, about a century apart.—A survey by Bellysis and others in 1537: Clarkson's survey in 1567, in consequence of which considerable works were done by Earl Thomas; and one of about 1650; and the middle of the last century is marked by the alterations under Hugh, first Duke of Northumberland.

The *Entrance Gate* from the town is preceded by a barbican or outer enclosure, like the city gates of York up to a recent date, which gave great strength to this part as forming the approach. There was the outer gateway opening into a narrow way between two lofty walls, so that if an enemy had passed the outer gate, the warriors could be hemmed in, and be here exposed to the weapons and missiles of the besieged on the walls above. Clarkson in his survey, 1556, states, that there was once at this part a drawbridge, for further security. It is evident that a fosse, or ditch, ran along this western face of the curtain. Then there was a portcullis and several pairs of wooden gates, as mentioned by Clarkson, and inside is the porter's lodge, as of old. The architectural features of this gate house and its barbican are very bold and striking, and the date may be assumed to be about 1350, at the time of Lord Percy, who added, it is supposed, some of the stone figures on the tops of the parapets. The only old figures are upon the middle gateway, and the half octagonal towers of the entrance keep, and are in quiet attitudes; but the later ones are in all sorts of violent fantastic action. This gateway is a very striking feature, with the two advancing turrets of rough stonework rising up to a noble height; the parapets pierced with embrasures, and surmounted by the figures in various attitudes; the return wall enclosing the narrow passage way, backed by the gatehouse rising above all, and by its frowning aspect forbidding approach to the foe. Clarkson notices this gatehouse as two storeys high, and as being in a very dilapidated condition.

Exchequer House.—Immediately within the gatehouse, or porter's lodge, and in the court, there was a large building, two stories high, named the exchequer house, but now not existing. It served for lodging, and possibly may have been appropriated to receive those strangers, whom it was not expedient or prudent to allow to enter the inner part of the castle. To the right hand, immediately within the gate, was another large two-storied building, the lower part appropriated to stabling for the horses of strangers or retainers, or common uses; the upper floor for grain. This Clarkson represents as having been recently built (1567).

Abbott's Tower.—Turning northward, or to the left, on leaving the porter's lodge, the curtain wall follows in a straight line from north to south for a distance of 180 feet, up to a large square corner tower, 40 feet by 30 feet, called the Abbott's Tower, and supposed to have served as a place to receive the Abbot of Alnwick Abbey, when that place was threatened or possessed by the enemy. Clarkson notices this tower as being, as it now is, three storeys high; the lowermost then occupied as an armoury. Between the gatehouse and the Abbot's Tower, the curtain wall has an embattled gallery all along, with parapets and embrasures, and midway between the gatehouse and the tower is a turret, sometimes, and now-a-days, called a garret, and, according to Clarkson, covered with freestone and two (houses) storeys high. These small interior garrets served as abutments to the walls, from the face of which they project, and thus afforded an opportunity to the warriors of enfilading the outside of the walls from tower to tower.

The Abbot's Tower forms a noble and commanding object at the angle, and rises up high above the curtain, with a turret at its outer angle, and its stone figures on the parapets. Thence the enclosure wall pursues another north-easterly direction, almost at right angles, but in a sweep, towards one

of the lofty towers of the keep. In its course it is divided into three sections by two garrets, with a chamber in each. The two first divisions have battlements to walk upon, parapets, and embrasures; and the construction for some height above the ground is remarkable for some of the Norman construction, consisting of parallel courses of small square stones. The third division, next the keep, had no battlement to walk upon, a precaution probably adopted in consequence of its proximity to the keep, so that the top might not form a gangway, affording easier means of access to the tower of the donjon.

As this forms the conclusion of the curtain wall on this side of the castle, we must resume the survey of its circuit by starting afresh from the Porter's Lodge House, in the same manner as Clarkson. On the southern side of the Gate House, the enclosure wall proceeds southward for about 80 feet in a straight direction to a square garret or turret like the ones already mentioned rising above the wall, the lower part acting as a buttress to the wall, and the upper part forming a small circular chamber. In a slightly slanting direction the circuit wall runs 70 feet to the corner tower, which is circular with a square base, consisting of three storeys.

Audit Tower.—From this corner tower the wall pursues a direction almost due N. & S. At the distance of 120 feet is a tower called the Audit Tower, of the like form with the last, three storeys high, the lowermost serving as a stable, and the upper two as lodgings. Between these two towers was a garret like the former ones.

Middle Gate House.—At the distance of 85 feet from the Audit Tower and dividing the two wards, is the Middle Gate House, a building of considerable importance, three storeys high, and in some parts four. At one end it projects beyond the curtain wall, and covers an area of about 52 feet by 30, with a projecting circular tower next the keep; under it passed the roadway from the outer to the middle ballium or ward. It had on the left hand a strong prison, and on the right was a porter's lodge as at present. Above were the lodgings for the constable, with such conveniences enumerated by Clarkson, as the hall, kitchen, buttery, pantry and lodging for the constable and other gentlemen to keep house in, but since altered to the chapel.

Gardener's Tower.—From the said Middle Gate House, the curtain wall continues its course till it reaches a tower called the Gardener's Tower, three storeys high, the ground floor serving for a stable, the middle one for hay, and the upper one as a chamber. Between the Middle Gate and the Gardener's Tower, there stood against the curtain wall a building three storeys high, in length 35 yards, and 8 in breadth, the lower storey being appropriated as a stable for my lord's horses, and the upper storeys as lodgings for two gardeners, and attached to this was a smaller and a larger house and a garden. Between the Gardener's Tower and the tower at the angle, were two little garrets in the wall, the lower part serving as a solid buttress to the wall, the upper for privies only and covered with stone.

The Corner Tower at the eastern extremity was circular without the walls, and square on the face towards the Ward or Court. Clarkson states, that it was then raised no higher than the battlements of the curtain wall, and was two storeys high; but in the plan before you, it rises two storeys above the battlements. It subsequently became much decayed, and during the last century was taken down and rebuilt completely circular in plan, with two square projecting turrets, and three storeys in height, and is now called the Record Tower, containing the museum of Egyptian antiquities.

Along the outside of the wall, from the first corner tower that we have noticed, in the outer or first ballium to the second corner tower, there is a very lofty bank, now partially filled in, and at the foot of which ran a rapid stream, which brought the waters from the moors and formed a species of fosse to the castle. There is a walk all along the foot of the high wall from the Gardener's Tower to the Corner Tower, which having a southern aspect, affords one of the most agreeable treats to walkers along its sunny pathway; and from this circumstance was a favorite resort of Canina.

It will be perceived that the general contour of the outline of the external walls enclosing the castle precincts assumes, as it were, somewhat the form of an isosceles triangle, of which the entrance porch and its lateral curtains form the base 416 feet in length, and the two longer sides converging up to the present Record Tower, about 680 feet in length, taken in a straight line.

The Ravine Tower.—From the diverging point therefore of the corner Record Tower, the wall pursues a north-east direction and reached a tower called the Ravine Tower, not now existing, being at the time of Clarkson, "so rent that y^{t} ys mooche like to fall," it was subsequently replaced by a garret called Hotspur's Chair. This tower corresponded in importance with the largest of that class, the lower floor served for a stable, and the two upper ones for chambers; its form was round outside the wall, square facing the ward. The curtain wall thence makes a sweep to an angular tower, in form similar to the last, called the Constable's Tower. It rose three storeys high, the basement was used as a buttery, and the two upper floors had two fair lodgings. In the curtain wall at this point re-appear the Norman walls, with a subsequent construction above them.

The Postern Tower.—The curtain wall then takes another direction, and forms a re-entering angle, and runs for a length of about 60 feet up to a square tower, called the Postern Tower, with an intermediate small turret, or garret. This tower is three storeys high, and the basement forms a passage for the postern, and above are two fair chambers; at the base of the postern are remains of the Norman wall. From this Postern Tower the curtain wall went direct to one of the towers of the donjon or keep, being without battlement, parapet, or embrazures like the corresponding length near it, already alluded to. This length was destroyed in the middle of the 17th century.

Chapel.—"Between the Constable's Tower and the Ravine Tower, was a faire Chapell of vij yeards height of the wall, in length xix yeards and vij yeards of breadth, covered with slate, the windows well glazed, in all things well repaired (the seyling thereof onely excepted); betwixt the said Chappel and the said curteyne wall ys builded one lytell house of two house height, of length viij yeard; the nether part thereof called the revestry, the over part thereof a chamber wth a stone chimney, wherein the lord and ladie wth their children commonly used to hear the service. The same ys covered with slate, ye loft thereof would (should) be repayred."

Conduit—"And before the said chapel door was a Conduit, built of stone and a cistern supplied with tryme and sweete water from one well called howlinge well, in pipes of lead.—(*Clarkson's Survey.*)

Between the Constable's Tower and the Postern Tower, was a brewhouse with all proper plant and fittings, and adjoining the Postern Tower a bakehouse; and near to them two houses, one for a slaughter-house, the other for stores; and there was a chancery house and a wood garth attached to the middle ward, in fact a complete series of domestic offices close in upon the keep. The keep itself was surrounded by a deep moat, which was dry; and the recent works have brought to light the retaining wall of the sloping ground next the keep towers. This moat was afterwards filled in, as we shall have occasion to observe.

The Keep or Donjon, as Clarkson calls it, formed a polygon, with a court yard in the centre, which was encircled by seven round towers and one square tower, under which was the gateway. The approach was by a drawbridge over the moat, and on either side, in advance, semi-octagonal towers, added by the second Lord Percy, about 1350, to the original square Norman tower. These semi-octagonal towers rise four storeys high, and contain on the entrance floor accommodation for a porter, and under the chamber, to the right, is a deep dungeon-prison, the only access to which is through the bottle-shaped ceiling by a trap in the floor, and there are loop-holes in the walls. The outer face of the archway next the court consists of a noble series of Norman mouldings, carved with enrichments, and there were originally two columns with their capitals on each side. Within the court, to

the right, is a draw-well in the thickness of the wall, with three pointed arches, surmounted by one large discharging arch, forming a very picturesque object; beyond which is a doorway, leading into a vaulted chamber, called by Clarkson "a fayre vaulte, which is the butterye, in length xvij yards, in breadth vi." Above this "fayre vault" was the hall, approached by an external flight of steps, and over the hall was the peculiar feature of two chambers. In the tower next that of the hall were contained the kitchen, sculleries, buttery, larder, &c. The lord's and lady's lodging was over the gatehouse. The other towers contained the accommodation for the household. They were all detached, except in one case, forming separate dwellings, united by curtain walls for the purposes of defence. And again, to use Clarkson's own words, "uppon the sayde lead ys a trimme walk and a fayre prospect." "There is raysed on the west side of the said donjeone one lyttle square tower, called ye watche towre, above the lead xiv yeard, wherein ys place for a watchman to be and a beaken to be sett or hung."

But there is one curious paragraph highly illustrative of the economy of the times, which we shall quote literally. "And because throwe extreame wind the glase of the windowes of this & other my Lords Castells and houses here in this cuntrie doothe decaye and waste, yt were goode the whole height of everie windowe, at the depart^re^ of his L. from lyinge at any of his said Castells & houses & deuringe the tyme of his L. absence or others lying in them, were taken down & lade appart in safetie; and, at sooch tyme as either his L. or any other sholde lie at anie of the said places, the same might then be sett uppe of newe, with small charge to his L. where nowe the decaye thereof shall be verie costlie & chargeable to be repayred."

We will now pursue the history of the Castle of Alnwick, with occasional reference to some of its Lords. As we have already noticed, in 1297 it came into possession of Lord Henry de Percy by a deed of conveyance, the original of which is preserved among the family muniments of His Grace, now in the charge of Mr. Williams, as Record keeper, who has most obligingly called my attention to this very valuable and remarkable record. It is from Anthony Beck, Bishop of Durham, who, it is said, always wore a suit of armour under his bishop's robe, and was called the fighting bishop. It bears date 19th November, 1309, and two days hence will be 547 years old. It conveys to Henry de Percy and his heirs the Barony, Castle, Manor, and Town of Alnwick, with the Towns, Hamlets and appurtenances thereunto belonging, with whatsoever else the said Bishop had of the gift of the noble Lord William de Vescy within the Barony aforesaid, and elsewhere in the County of Northumberland; and also the reversions of the dower lands of Isabella, widow of Lord John de Vescy the elder, and Isabella, widow of William de Vescy, expectant of the deaths of these ladies respectively.

The son of Henry de Percy defeated and took prisoner David King of Scotland, at Neville's Cross, where 15,000 Scotchmen fell. He constructed the semi-octagon towers to the keep, as an advanced work, put up stone figures on the parapets, and added the barbican to the entrance gateway, and many other works.

The great grandson of the first Henry de Percy was created Earl of Northumberland at the coronation of the wretched Richard II, and, after vanquishing the Scots at Hamilton in 1462, was himself slain at the battle of Bramham Moor, 2nd of March, 1407. His son was the valiant Hotspur, whom Shakespeare has immortalized, who was slain at Shrewsbury 21st of July, 1403, that is four years before, and the son of Hotspur succeeded to the grandfather's inheritance. He repaired the castle and fortified the town of Alnwick. Then succeeded the cruel and disastrous times of the civil wars, in which the Percys took always a conspicuous part, and paid with their blood their devotion to

their allegiance for their sovereigns. The son of Hotspur fell at St. Alban's, and was buried in the Lady Chapel of the Abbey; his son was slain at the battle of Towton, and Henry Percy, the fourth Earl, was murdered in a popular tumult at Cocklodge, in Yorkshire.

Mr. Dick, in his Inscriptions and Devices in the Beauchamp Tower of the Tower of London, recently published, has the following remarkable paragraph in connection with this noble family, p. 28. "Immediately below the above names is the following inscription—

SARO : FIDELI :—
I N G G R A M
P E R C Y
1537.

(I will be faithful, Ingram Percy, 1537).

During the year 1537, being the 28th of Henry VIII, we read of several rebellions in different parts of the country, caused through the great dislike, that was generally felt to the alterations, which were being introduced in the religion of the country. In the latter part of the above year several of the northern gentlemen joined in a conspiracy (Aske's) to oppose the measures, that were then being passed. Among others, were the two sons of Henry, the fifth Earl of Northumberland, (Sir) Thomas and Ingram Percy. This rebellion was quickly suppressed, and the authors of it apprehended. Thomas Percy was condemned and executed at Tyburn, the same year; but Inggram (the author of the above inscription) after being in confinement a short time, was liberated, and died in the latter end of the following year, 1538. The title and estates then seem to have been estreated for nineteen years, but were restored, in 1556, to Thomas, the grandson of the aforesaid Sir Thomas, and he became seventh Earl of Northumberland, by a grant of Philip and Mary. He executed considerable works to make good the dilapidations into which the castle had fallen during the period so disastrous to the family; and it was during this period that Clarkson's survey was made. The ravine tower was taken down, and the reparations and alterations carried out in pursuance of his report. This Earl seems to have maintained the faith of his fathers, not adopting that of the Reformation. He was beheaded at York, 22nd August, 1572, under Elizabeth, avowing the Pope's supremacy, and was buried in the church of St. Crux, outside which he had suffered, and his iron helmet still hangs suspended on the wall near his grave. His son and successor was found shot dead in the Tower of London, 1585, also during the reign of Elizabeth.

In 1632, Algernon Percy, the tenth Earl, succeeded to the inheritance; he was the Lord High Admiral of England, and had the charge of the children of Charles I, and during his life the large drawings appear to have been made, which give the plans and view of the castle with considerable accuracy, and enable us more fully to appreciate its actual state at that time.

Afterwards the castle fell into great decay, and at the time of Charles II, 1649-60, it is described by Ogilvy, the cosmographer, as "once large but now ruined."

WORKS BY HUGH THE FIRST DUKE OF NORTHUMBERLAND.

No incident of any importance is recorded as occurring in connexion with Alnwick Castle, from the middle of the seventeenth century till the middle of the last, when Lady Elizabeth Seymour, the heiress of this noble line, married Sir Hugh Smithson, Bart., who, on the death of his wife's father, Algernon Duke of Somerset, became the thirteenth Earl of Northumberland, and was created Duke of Northumberland in October, 1766.

In his time were executed, by Adam the celebrated architect, very important works, that materially changed the aspect of the castle. The chapel, and all the domestic buildings, which existed in the middle ward or ballium, were taken down, as also the exchequer house in the outer ballium near the porter's lodge, and the large two-storied building opposite to it; so that the two wards were left quite free and disencumbered of buildings, and the moat round the keep was filled in, and earth piled up high against the donjon tower and its curtain walls. Numerous domestic offices were erected outside the south curtain wall from the south west corner tower to the Garden tower.

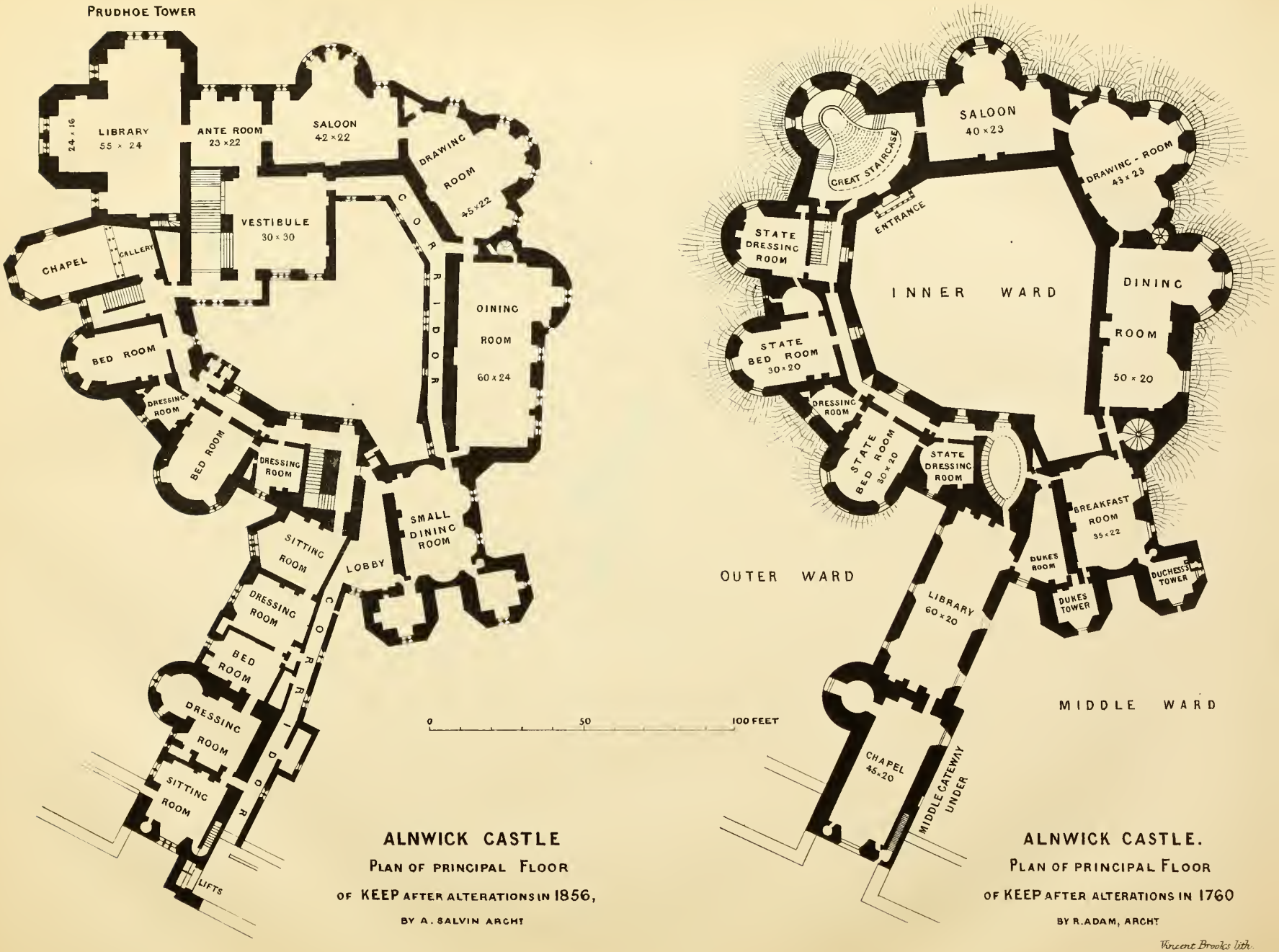
A large stable court was added, surrounded with stabling for forty horses, and coach houses with ample accommodation over. The easternmost corner tower of the middle ward was taken down and rebuilt perfectly circular, with two square external turrets.

The changes inside the keep were no less important. The towers, which hitherto had contained independant groups of chambers, with no connection between each other, and united only by curtain walls, were completely gutted, the inner walls carried into the court, and ample staircases and entrance hall gave access and communication throughout to the range of imposing rooms, which succeeded each other on the one pair floor, the entrance floor forming a species of basement, with the sculleries, confectionery, butteries, pantries and cellars. The middle gateway was connected with the keep by a wing building, which contained a suite of servants' offices; and on the other side of the gateway, next the curtain wall, was the kitchen and its dependancies. No great reverence was shown for the erections of other times, for in order to produce greater convenience, one of the easternmost towers of the keep was taken down and removed further to the south. The chapel, which had been pulled down in the middle ward, was replaced by converting the space over the middle gateway into a noble place of family worship, and it was approached through the library, that was over the servants' offices in the wing between the gate house and the keep.

There was an ample breakfast room over the gateway of the keep, and the semi-octagonal turrets still retained, as of old, their traditionary appropriation to the Duke and Duchess, by whom they were and are specially occupied.

There was the desire to retain the decorative style of the Mediæval times; but it assumed the taste, since so expressively attributed to Batty Langley; and in order to gain more light, the narrow apertures of the original times were widened, and the upper range exhibited a series of quatrefoils, which destroyed the sentiment of the earlier character of the castle. But still, although the sizes of the dining hall and reception rooms were spacious, and they were lofty in height, they were devoid of facility of access, one room often serving as passage way to the other. Such was Alnwick about 1780.

His Grace the present Duke of Northumberland, upon coming into possession of Alnwick Castle, found a great absence of domestic comfort and a deficiency in those modern conveniences requisite in the residence of a nobleman of his Grace's rank. The considerable transformation, which it had undergone in the last century, as we have observed, and in remoter periods, had caused it to lose many striking features, important parts having been reduced in size and consequence, depriving it of much of that original dignity and variety of effect, which it doubtlessly possessed in ancient times. His Grace therefore determined, to a certain extent, to remodel the plan of the central mass in a manner, that should combine modern conveniences in the interior with the castellated exterior character of the fabric. He desired at the same time to do away with the accidental tameness and insipidity of its outline, which it had seemingly acquired during periods of adverse treatment, and by increasing the altitude and prominence to certain leading masses, to give it that variety, grandeur, and due subordination of parts, which should convey the expressive sentiment of past times, when, as a leading frontier fortress, it seemed to frown defiance to its assailants, and to afford protection and a safe asylum to



ALNWICK CASTLE

PLAN OF PRINCIPAL FLOOR

OF KEEP AFTER ALTERATIONS IN 1856,

BY A. SALVIN ARCHT

ALNWICK CASTLE.

PLAN OF PRINCIPAL FLOOR

OF KEEP AFTER ALTERATIONS IN 1760

BY R. ADAM, ARCHT

Vincent Brooks lith.

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the many retainers, tenants, and dependants of the Percy family, and to the other inhabitants of the surrounding districts.

This task his Grace confided to the skill, the taste and experience of his architect Mr. Salvin, whose many works of a like nature offered the best assurance that the Duke's noble idea would be fully and worthily realised.

But a question of a more complicated nature, and less easy of solution, occurred, as to the treatment of the interior. Was the residence of the noble of the 19th century to reflect the stronghold of the baron of the 12th or 13th? Were the rude, though imposing arrangements and decorations of those periods, however dear to archæological associations and to historic precedent, to be repeated here? Would they find a response, a fitness to the refined manners, customs and feelings of our time? This appeared impossible. Yet to adopt the decorative fashions of the day,—the variable and transitionary tastes of the middle of the 19th century,—would be to sacrifice that innate and distinctive consequence and dignity, which tradition and a certain remoteness of period can alone give, and without which, Alnwick would be regarded merely as a toy and caprice of an individual, and a creation of the passing moment.

To surround himself with noble and imposing associations, was in his Grace's mind a duty he owed to himself,—to the line from which he was descended,—and to those who should succeed to a title consecrated in the annals of the country. This was a conviction to its fullest extent shared by the Duchess, and adopted as a leading principle by the architect, who was to take so important a part in the restoration.

With these impressions on his mind, his Grace visited the most famous palaces in Italy; and being in Rome, was much struck by the princely grandeur of the palatial residences of the titled families of that city, erected for men who took leading parts in the eventful political struggles of the most troublous periods of Italian history, and carried out by vigourously minded artists of the 15th and 16th centuries. Leonardo da Vinci, Michael Angelo, Raffaelle, Bramante, Vignola, Peruzzi, and others, whose genius was fostered and formed by the contemplation of the glorious productions of ancient art,—these artists were inspired by the grandeur of the Roman monuments, and produced works which, for breadth of effect, largeness of conception, and richness of detail, were worthy of being placed side by side with those, which they had studied with so much devotion.

It occurred to the Duke, that here was a fitting style for the interior of Alnwick Castle,—of a period to a considerable degree remote,—of a style not too familiar,—of a dignified aspect,—in size and treatment imposing,—yet not in any of these respects to such a degree peculiar, as to be at variance with our present usages, our present feelings, or inconsistent with the character of such an edifice. In point of execution the skill of the artists of the day and the perfection of the manufactures of the present period could worthily, and without any violent departure from their actual practice, reproduce the carving, the paintings, the stuffs and silks and hangings, in a manner not unworthy of the best period of similar decorations. At Rome his Grace found men well versed in the principles and execution of such a work, and addressed himself to the late Signor Commendatore Canina, whose studies and whose publications were the best guarantees, that the spirit and sentiment of the idea could be faithfully carried out; assisted, as he would be, by the pictorial and graphic skill of the Signori Montiroli and Mantovani, whose works were already advantageously known.

And eventually another patriotic purpose was to be carried out, which had its influence in all the operations of this vast undertaking. This was, that the native talent of the country should be made, and taught where unprepared by previous practice, to take part in every possible way in all the artistic and mechanical details; and that the marbles of the country should be made available, wherever they

could be introduced. His Grace was seconded in this by the cordial concurrence of his architect Mr. Salvin, the Commendatore Canina, and his able assistants. Schools were formed,—the ablest artisans got together,—and rude skill made to acquire astonishing facility and tact of handling and treatment under the able instruction of the Signor P. Leone Bulletti of Florence, to whose talent is entrusted the execution of the wood carvings. Thus there will be established a class of native artists in this country, most rare, but hereafter ready to carry out the works of those, who may have the taste or spirit to introduce true and genuine art, instead of being satisfied with mere mechanical repetition.

Such is the basis of the conception of the *restoration* of Alnwick to its position among the noble edifices of the land, of which England may be justly proud,—baptised as it is with the noblest blood of its sons,—surrounded by the halo of past glories,—and endeared to the affections and respect of a happy and grateful tenantry.

It was of necessity that, adopting the Roman style, it should not have a merely foreign aspect, but be interwoven with the legends and ballads, the hills, the valleys, and the plains of the surrounding country,—the legacy of centuries past,—with the traditionary feuds of Border conflicts,—the many strifes and contests,—each of which has its recorded story in a thousand spots around the castle. That the stranger should never be unconscious, that he is in the castle of the Percys,—England's frontier stronghold,—whose history is a part of the annals of the country, and where a Hotspur, a Malcolm, a William the Lion,—the touching incidents of a Chevy Chase, and the catastrophe of a *Flodden*, have given it a renown second to no other in the realm. Its history was to be read upon its walls, and its traditions were to speak home at once to whoever should enter within its gates,—a task, as difficult as it was grave, demanding an entire devotion of every faculty, a perfect abnegation of self in all concerned in carrying it out.

DESCRIPTION OF THE STRUCTURAL OPERATIONS,

Read by A. Salvin, Fellow, Architect to His Grace.

After the able papers you have heard on this and a previous evening from Professor Donaldson, there is little of interest that I can add. But with your leave I should like to address to you a few words on the part I have taken in the alterations now in progress at Alnwick Castle.

In the Spring of 1854, His Grace the Duke of Northumberland wrote to me from Rome, desiring to have plans and interior elevations of the entertaining rooms (copies of which are on the table) that he might consult some architects at Rome on the subject. Soon afterwards, designs for ceilings, &c. were forwarded to England for the opinion of some of His Grace's friends. Beautiful as these drawings were, I had great doubts of the propriety, as well as practicability, of introducing Italian art into a Border Castle. My own wish would have been to devise Mediæval decorations to a plan consistent with modern requirements, and that would have accorded with the exterior as well as the associations of the place. I must here observe that I do not for a moment admit, what many opponents of that style urge against it,—that because the doors, the windows, and the ceilings are Mediæval, therefore the floors must be covered with rushes, and the furniture benches. It certainly was not the spirit of that style to be so cramped. The artists of those days availed themselves of the best the age produced, and the style will be most completely carried out in our present time by introducing all modern improvements, that will conduce to elegance and comfort.

In this instance, however, be it observed, none of the ancient features remained internally; and indeed the arrangement of the interior was so changed in the repairs of the latter end of the 18th

century, that there was nothing of archæological interest to preserve; therefore whatever was done must necessarily be different from what existed in the old Border Fortress of the 14th, 15th, and 16th centuries.

His Grace having honoured me with instructions to prepare plans and elevations, my duty was to exert my utmost endeavours to arrange the best plan the nature of the structure would admit of, and to improve the external appearance by adding such features as it most required. At the same time giving every facility to the introduction of the designs of Commendatore Canina.

The foundation stone of the Prudhoe Tower was laid by the Duchess on the 25th of November, 1854, and by July in the following year it was, together with the entrance, built two-thirds of its height, as well as rebuilding the Dining Room, which had been found in too dilapidated a state to repair. 12,000 tons of new stone had been, up to that time, used in these buildings.

In the summer of 1855 the Commendatore Canina sent over Signior Monteroli, an architect, and Signor Bulletti, a carver in wood; the former to make drawings, full size, after the approved designs; the latter to carve samples to be taken to Italy to be executed, it being at that time intended that the whole of the ceilings and other decorations should be made in Italy.

His Grace having confided to me the general direction and execution of the works at Alnwick, it struck me, that not only the plain surfaces of the ceilings might be better done on the spot, but also some portions, at least, of the carvings, and that there was a most favourable opportunity for creating a school for carving in the Italian style. I found a person (Mr. John Brown) working for a cabinet maker in Alnwick, who showed considerable dexterity in using his carving tools. I gave him a piece of the egg ornament to copy, in which he was so successful, that I sought out others, and gradually collected a sufficient force from Glasgow, Shields, Sunderland, and Newcastle, in all twenty-one men and six boys, who are now executing the carvings, under the direction of Sig. Bulletti, with Mr. Brown as foreman, in a manner that will be a credit to the country and themselves. For any similar employment, I can with great pleasure and satisfaction recommend them to your notice, not only as able artists, but orderly and well conducted men.

On the walls there are plans and elevations of the castle as I found it: also, plans and elevations of the alterations now in progress.

By reference to the former plans, you will see a want of proper communication,—that the access to the Drawing Room was through the Saloon or the Dining Room,—that the Dining Room could only be approached through the Drawing Room, or by a circuitous route in the Bed Room Passage, and Breakfast Room. The Kitchen was also divided from the Keep, in which the Dining Room was situated, by an open archway, through which the carriages of the company were passing about the same time the dinner was crossing it. There are legends of patties having been blown about the court-yard. The Library was far removed from the other sitting rooms, so that after breakfast the company were separated, trusting to the next hospitable meal to bring them together again.

To obviate these defects and also increase the accommodation, I had to take down two towers. One to make room for the Prudhoe Tower, in which are the Library and the Great Staircase,—the other for a Chapel and a Staircase to the Bed Rooms. I had also to obtain a better Entrance, and, by projecting a corridor on arches and corbels, I gained separate access to the various sitting rooms, besides adding a picturesque feature to the exterior. The entrance is now from the covered Drive in the Inner Court into a low Hall, and thence, passing through the old wall of the Waiting Room, by a staircase 12 ft. wide, to a vestibule on the principal floor, 30 ft. square; from thence into an ante-room, with the Library on the left hand and the Drawing Rooms on the right: the Vestibule opens into the Corridor before mentioned, and so on to the second Drawing Room, the

Great Dining Room, and the Small Dining Room. The Vestibule also gives access to the Chapel, and the Passage to Bed Rooms on that floor, and the Staircase to the Bed Rooms on the upper floor. In altering the present Library into the Private Rooms of their Graces, I constructed a Passage across the Gateway, and at the end a Lift from the Kitchen, by which the patties may travel in safety.

These alterations caused no destruction of ancient buildings: for, on reference to a drawing, which shows the plan of 1630, distinguished by a light shade, from the plan of 1760, marked by a pink shade, you will see that many of the towers had been rebuilt in different positions. As, for instance, the Tower on the Drawing Room could not originally have been so near the Hall, because a Kitchen intervened. Neither could the original Tower west of the Octagon Towers of the Gateway have admitted the present Library, and a Dressing Room between it and the Gateway. There is also another proof of their modern construction. In pulling down the Tower where the Prudhoe Tower now stands, a bottle was found in the wall, containing the following inscription:—

"This Castle was built by Matthew and Thomas Mills, Master Masons, in the year 1764."

The mortar and masonry was also of a very different description from the old portions.

As far as my investigations go, I believe the only Round Tower to be that of the Dining Room, and this one was in a very dilapidated condition,—the outer shell good, but the lower portions of the interior built with mud, and further weakened by three windows, that had been cut through the wall in the alteration of 1760.

This tower has had the delicate operation (which you all so well know) of having its interior picked out and a new one put in, while its skin remains the same.

During the last two years there have been about 200 men employed, viz.—Quarrymen and Labourers, 42; Workmen's Labourers, 50; Masons, 60; Carpenters and Joiners, 16; Plumbers, 6; Plasterers, 6; Smiths, 10; Painters and Gilders, 8; Carvers, 27; Clerk of the Works and Foremen.

The building stone is from a quarry belonging to his Grace, three-quarters of a mile distant on Alnwick Moor. The steps are from Rothbury Moor, twenty-two miles distant. Each step is in one stone, 12 feet long, and the landings of one stone, 12 feet square. Stones of 30 feet square and 50 or 60 feet long may be obtained if required; its texture is very hard and of a beautiful white, free from marks or flaws.

DESCRIPTION OF THE INTERNAL DECORATIONS OF ALNWICK CASTLE,

Abridged from the Specifications of the late Commendatore Canina, Architect, Director of the Internal Decorations.

GENERAL ARRANGEMENTS.

It having been determined by His Grace that all the decorations should be executed after the best style of the first Masters of the 15th and 16th centuries in Italy, particularly in Rome; and that nothing should be done without his approval, the execution of the various works in stucco, marble, wood, and other materials, will correspond in style and character with the best Italian work of the revival by the ablest artists; commencing at the Entrance with simplicity, and increasing in richness of decoration according to the destination of the several apartments.

ENTRANCE ON THE GROUND FLOOR.

The *Ceiling* of stucco work to be simply arranged without ornament, and executed by ordinary workmen.

Walls.—The three arches on the side to have architraves, without imposts. The two doors on the side to be ornamented with simple bands. Between the doors to be placed a picture representing dogs, already painted. The three arches in the walls to be decorated simply like the preceding. The arch in the wall, where a window exists, to be ornamented in the same manner.

The *Fireplace*, in the same wall, to have a plain marble chimney piece; above which will be placed a picture, already painted.

Skirting.—At the foot of all the walls to be fixed a skirting of grey Bardiglio marble, without any moulding or considerable projection.

The *Pavement* to be made wholly of the white stone of the country, or of tiles.

APPROACH TO THE STAIRCASE.

The *Ceiling* to be decorated in stucco, and divided into three compartments with small bands or fascias.

Walls.—The three arches leading from the entrance vestibule to this approach to be also simply decorated in stucco, with architraves down to the floor, without imposts; with circular panels in the spaces above. Laterally, the two other arches will be similarly decorated.

The principal access to the staircase is flanked by two pilasters, which support an architrave or beam, by brackets attached to them. The pilasters to be lined with colored marbles. The soffit of the architrave or beam to have sunk panels.

In front of the two pilasters, and corresponding with the centres of the two lateral arches of the entrance to the staircase, will be placed two pedestals of grey Bardiglio marble, supporting candelabra, sculptured in white marble after similar works by the ancients.

The *Pavement* to be made of the white stone of the country, with the addition of some black squares.

STAIRCASE. GROUND FLOOR.

The *Ceiling* to be decorated with panels in stucco, with a little more ornament than in the preceding, and with a circular centre.

The *Wall* opposite the three arches, to be faced with colored marbles, with bands and compartments, of approved design ; and this decoration to serve also as a continuation for the imposts and as base to the grand staircase. Opposite the stairs, an arch to serve for the decoration of a window recessed in the thickness, before which will be placed a statue or a group in marble, in order to cover the lines of the window, which are not in harmony with the internal decoration.

The *Pedestal* or *Dado* to be likewise of colored marble, corresponding to the wall facing the entrance; and midway of this wall, will be placed two candelabra, similar to those before-mentioned.

The *Pavement* to be of the white stone of the country.

STAIRCASE.

The *Grand Staircase*, to be decorated above with three large arches, forming together the respective cross forms of the vaulting. The arches to be decorated with stucco in compartments, with mezzotints in the ground, in imitation of the Loggie of the Vatican. A similar decoration for the ceiling, and for the ground of the arches in the walls above the imposts.

The *Walls* will be lined with coloured marbles, as also the piers of the arches, finishing at the imposts.

At the head of the stairs, on the principal floor, the same decorations will occur, with panels to correspond with the other arches; the existing windows being reduced to a convenient shape to adapt them to the character of the internal decoration. In the archway in front, and in the opposite one, will be placed a balustrade of marble, with a large candelabrum, likewise of marble, on a pedestal.

The *Flights of Stairs* to be divided by a landing, with another at the head, from which five steps lead to the Vestibule or Hall on the principal floor.

All the steps and landings to be of the white stone of the country.

Flanking the rake of the stairs will be a base or spandril, from which rise the piers of the arches, having imposts and dado of white marble, with compartments of colored marble.

VESTIBULE OR HALL.

The *Ceiling* of this room, which is quite square, to be coved and executed with ornaments in stucco, painted. In the centre of the cove on each side a picture will represent a subject from Chevy Chase.

In the flat part of the ceiling a picture will represent some grand historical subject of the English nation, such as King John signing Magna Charta.

Walls.—In the wall next the staircase are two large arches, one gives access to the stairs, the other will have, as described, a balustrade and candelabrum in the centre, as in the one at the head of the stairs. On the side wall a large picture by Sebastian del Piombo, which His Grace possesses, will be placed in the position marked for it.

Frieze.—In the upper part an ornamental frieze will be painted with allusive ornaments on the sides.

The *Walls*, finishing at the imposts of the arches, will be lined with colored marbles, to carry round the decorations chosen for the pilasters and the walls of the staircase.

The *Pavement* will be formed of various marbles, with an internal band and small squares in the centre, to be sent from Rome with the other marble for lining the walls.

ANTE ROOM.

Ceiling.—This room which, is nearly square, will have a flat ceiling executed in wood, with regular forms, and decorated with ornaments in relief, painted. In the four angles of the ceiling will be painted boys connected with the picture in the centre. All the remaining decorations will be executed in wood.

A *Frieze*, with cornice and architrave, will be placed in the upper part of the walls; in the centre of the length of this will be introduced pictures of boys grouped, and on each side landscape pictures.

In the *Wall* the two windows will be reduced internally to a convenient form; and between them will be placed a sculptured chimney piece of coloured marble, ornamented at the sides with terminal figures.

Damask.—All the walls will be covered with satin of a green colour, of the height of 10 feet 6 inches.

The *Dado* will be executed in mahogany wood of a dark yellow colour.

The *Floor* to be of wainscot, covered with a carpet.

LIBRARY.

Ceiling.—This noble room, of a regular form, will be decorated with a flat ceiling in wood, carved and painted, with ornaments in the panels and compartments. There will be, besides, in each of the main compartments, a trophy allusive to the Arts and Sciences.

The *Walls* will be covered with two tiers of bookcases, a staircase in the thickness of the wall, leading to a gallery, giving access to the upper cases.

Bookcases.—The bookcases will be carved or wrought in maple-wood, polished, the decoration being applied to forms and depths the same as those of the bookcases in the existing library.

Pictures.—In the upper part of the walls portraits of the illustrious family will be placed, on a ground ornamented and painted red.

Windows.—A large window of two heights, which occupies one side, precisely facing the entrance into the library, will be reduced to a form convenient for the internal decoration. At the sides will be placed the lower tier of bookcases, and in the space above portrait pictures, as already stated. In the same sides will be placed two portraits, sculptured in basso relievo, by Sig. Macdonal, of Rome.

Fireplaces.—The three fireplaces in this room, will have chimney pieces of various coloured marbles, with simple ornaments proportionate to their relative dimensions.

Other Windows.—At the left of the entrance of this room, at the end, another large window of two storeys, crossed by the gallery to the second tier of bookcases, will also be reduced to a convenient form internally.

The wall fronting the large window will receive bookcases in two tiers, having in the centre the principal doorway marked with appropriate decorations.

Floor.—The floor of this room will be of wainscot, covered with a carpet.

SALOON.

Ceiling.—This room, for which the decorations were determined in the year 1855, is now far advanced. The form is regular, and polygonal in the centre, which occupies the interior of one of the circular towers of the castle. One portion of this ceiling was executed in wood with carvings, in August this year, to show the effect of the design made in Rome in the beginning of 1856.

A *Frieze*, with ornaments and boys on a red ground, painted in Rome by Sig. Mantovani, goes round the room, under the cornice, above which is a flat ceiling; below is an architrave, which also goes round the room; the whole forming a very rich and effective entablature.

Damask.—The walls will be covered with satin of a yellow colour, similar to Genoa tissue, of the height of 13 ft. 3 in.

Fireplace —On the long side of the room, in the centre, will be placed a marble chimney piece, executed in Rome, and decorated with two figures of slaves.

Doors.—In the centre of each end is a door, to be executed in the same style as the ceiling, having the same colours, and rich carvings on the panels and dressings.

Windows.—In the other walls the five windows will be decorated with archivolts carried by pilasters, within which will be painted ornaments, as also on the external part of the window shutters, to correspond with the rest of the decorations.

Window Curtains.—Rich hangings will be fitted to the windows.

The *Dado* will be of walnut-wood, from Italy, and of the height of 3 ft. 6 in.

The *Floor* will be of wainscot, covered with a carpet, harmonizing in design and colours with the rest of the decorations.

DRAWING ROOM.

The drawing room is of a polygonal form, composed of three sides, half octagonal, and one rectangular.

Ceiling.—A well studied combination of the polygonal form produces the decoration of the ceiling. All this ceiling is executed in wood, and at present the ornaments are being executed; these will serve as a model, both for the carving and for the decoration in colour.

Frieze.—The frieze is composed of ornaments with boys, on a blue ground, already painted in Rome by Sig. Mantovani; a carved cornice over it will serve as an impost to the ceiling, and a corresponding architrave will complete the upper part of the decoration.

Chimney Piece.—In the centre of the longest side of this room will be placed a chimney piece of white marble, with two canephoræ, which are being executed in Rome.

The *five Windows* round this room will have a decoration in wood, with pilasters and archivolts, and these will be painted with ornaments, as will likewise the shutters.

Damask.—All the walls will be covered with a red satin drapery, of Bolognese manufacture, from a drawing prepared for the purpose.

Dado.—In the part below a dado, like that in the preceding room, of dark Italian walnut.

The *Floor* will be of wainscot, covered by a carpet.

DINING ROOM.

The rectangular form of this room offers a good opportunity for regular divisions, according to a drawing executed in Rome in 1856.

The *Ceiling* will be carved, and left with the natural tint of the wood. A cornice, with modillions, crowns the walls; and underneath it a painted frieze, divided into pictures of allegorical or historical subjects, as shown in a sketch by Sig. Mantovani.

Damask.—The colour of the damask for the walls to be carmine red; the height about 15 ft.

Chimney Piece.—In the centre of the long side of this room a large marble chimney piece, composed of two figures, adapted from the most celebrated works of the ancients, agreeing with the remaining architectural decorations, but varying from all the other chimney pieces.

Pictures.—Above this chimney piece will be placed a large frame, carved to correspond with the ceiling and chimney piece. It will contain a picture, now in the present library. On the other side walls will be placed similar portrait pictures.

The *Dado* will be of choice wood, divided into panels, alternately plain and carved, of the height of 4 ft. 7½ in. The carving to be of the style of that in the choir at Perugia, and other similar examples. In the divisions of the parts above will be arranged ornaments, supporting cornucopiæ for lights, as well as two small candelabra above the chimney piece.

Doors.—To preserve symmetry it is proposed to place doors, two at each end of the room, with moulded jambs and entablature, the panels and mouldings enriched with carvings.

THE CHAPEL.

The decorations of this Chapel being in the Mediæval style, it is intended to introduce in the lower part mosaic decorations, especially in the parapet or fascia at the base of the windows; having compartments of Alexandrine work, like those in the ancient Basilicas, and in Westminster Abbey, composed of hard stones, such as porpyhry, serpentine, &c.

The space under this parapet, down to the skirting of the floor below, will have like decorations; but instead of "Pietre dure" they will be of Majolica.

The *Pavement* of the passage in the centre of the floor, and the space where the communion table is placed, will be arranged in divisions of mosaic, like the parapet under the window.

Such is the brief statement of the structural and ornamental operations of the most important class, now carrying on at Alnwick Castle. The style of decoration, that has been adopted, will, of course, admit of a variety of opinions among artists and men of taste; arising from education, predilection, and consequent habits of thought. But, it will be allowed, that the style has not been selected without much and deep consideration, and is justified by the precedent of all periods. And all must agree, that the execution of the work is being carried out with a grandeur of idea, a munificence, a considerate love for the arts and with a generous public spirit, worthy the characteristic nobility of the princely line of the Percys.

T. L. D.

At the meeting held November 3rd, the Chairman, Mr. Cockerell, R.A., and Mr. Ashpitel, Fellows, bore personal testimony to the correctness of the eulogium contained in Mr. Donaldson's Memoir of the late Commendatore Canina.

The Honorary Secretary for Foreign Correspondence was requested to communicate to the Academy of St. Luke, Rome, the expression of sincere sympathy on the part of the Institute in the loss sustained by the decease of the Commendatore Canina.

Thanks having been voted to Mr. Donaldson for his Memoir, that gentleman then read the first part of a discription of Alnwick Castle. Mr. Godwin, Fellow, suggested a vote of thanks to the Duke of Northumberland for directing the communication to be made to the Institute. The Chairman concurred, and said Alnwick was the Windsor of the North, and highly interesting from its historical and traditional associations. It was delightful to find that the Duke of Northumberland set a proper value on these interesting remains.

Mr. Salvin, Fellow, stated that his Grace had no reserve whatever on the subject, and any information which could be brought to illustrate it was at the disposal of the Institute. The vote of thanks was then carried by acclamation.

At the meeting held Nov. 17th, after the paper had been read, Mr. G. G. Scott, V.P., Chairman, observed, that there were few questions attended with greater difficulty to the architect than the mode of dealing with castles. For the last half century it had been the fashion to build new castles; and, although Mr. Salvin had built the most complete one—a perfect model of a Mediæval fortress—that gentleman must excuse him for expressing his opinion that building castles was one of the greatest fallacies that could now be carried out. They were not necessary, as in the middle ages, and it was a great mistake to suppose that a building to be erected in the Mediæval style must be a castle. He most earnestly hoped that they had seen the last of *new* Mediæval castles. The restoration of *genuine* Mediæval castles was entirely another question. The examples which had come down to the present time were glorious remnants of the art, and of the noble thought of the artists of former days, who designed those structures with the greatest ability, and carried them out with a grandeur of idea and a nobleness of sentiment unequalled by the works of any age. These venerable relics deserved the most careful conservation, and in any alteration of them it would be right, as Mr. Salvin had done, to restore them, in all general features, to their ancient state. These buildings, however, in

most cases were now occupied by noblemen who had not, as in former times, to defend the borders against a neighbouring kingdom. He agreed with Mr. Donaldson, or rather with the sentiments of the Duke, expressed by Mr. Donaldson, that a nobleman of the present day should not immure himself in a fortress, or live in a guard-room; but in going beyond that point, he thought it his duty, as representing, in some degree, the Gothic class of the profession, to say, that he believed there were others besides himself who would think the Duke had been mistaken in the rest of his logic. This difference of opinion, he (the Chairman), wished to express in the most tender manner. The Duke had been animated with the most noble feelings, and had called to his assistance an architect who, in the particular style in question, was one of the ablest in the profession; and he had also secured the aid of one to whom they owed much for the learned manner in which he had investigated ancient art, and the valuable works he had produced, and in regard to whom the greatest respect and tenderness of treatment were due, from the melancholy circumstances of the moment. There was not the least reflection on the judgment of Canina. He had carried out the works at Alnwick most admirably in the style which had been chosen; the only possible reflection would be upon the logic of the Duke of Northumberland, which had induced him to adopt that style, and consequently to entrust the work to the Commendatore Sinor Canina. His own opinion was that the art of the middle ages was just as capable of being applied to the wants of the present day, and particularly to the fitting up of Alnwick Castle, as the art of any other period. The great principles of decoration were the same in every style. Those principles arose from nature, and it was therefore quite compatible to carry out all that was required at Alnwick in the same style as the architecture of the exterior of the building, as in the style derived from the Renaissance Palaces of Rome; and further, that in doing so Mr. Salvin might have done much more towards carrying out and developing a style of our own than could possibly be done by carrying out the Italian style. It might have been possible to take up the spirit of that style in such a manner as to have formed a style of our own; and with all due respect for the noble and generous sentiments of the Duke of Northumberland, and more especially for the great abilities of Sinor Canina, he must repeat that he thought his Grace had made one of the greatest and most lamentable mistakes which had been made in the present day.

Mr. M. D. Wyatt, Hon. Sec., observed that Mr. Scott had alluded to himself as identified with Mediæval architecture in this country. Mr. Scott's sentiments, however, differed so much from the Mediæval spirit, and were so consonant with the spirit of our own times, that he (Mr. Wyatt) thought he should be rescued from such an accusation. Mediæval decoration was generally spoken of as if it were necessary that the precedent of our forefathers should be taken exactly as they had left it to us, In this country, neither sculpture nor painting had been developed in such perfection in Mediæval times as would be required now. A general code of grammar was an excellent thing; but he hoped that the Chairman and all those who advocated the revival of Mediæval art, would endeavour to disengage themselves from the rigid trammels of the past, and to fling away the shell, now that they were happily getting at the nut.

Mr. Pocock, Fellow, considered that the Duke of Northumberland had adopted the modern Italian architecture of the 15th and 16th centuries, because, in that style, the architecture of ancient Greece and Rome had in fact been reduced and adapted to modern wants. It was very different, however, with regard to Mediæval architecture and decoration, which had not been so modified at present; but which he hoped would be under the able hands of its professional admirers. A nobleman, however, seeing such an adaptation as the Italian style prepared to his hands, would naturally rather adopt it than attempt to carry out the Mediæval style, by which he might, without first having seen something executed in accordance with it, incur the risk of failure.

The Chairman explained, that when he spoke of the question as a mistake, he merely did so in an abstract sense, and not at all dogmatically. Holding, as he did, that Mediæval architecture was equally capable of adaptation to modern purposes as Italian architecture, he could not but lament that so magnificent an opportunity as the present, in the hands of one of the best Mediæval architects, should have been lost.

Mr. Jennings, Fellow, could not concur with the Chairman in the hope that castellated architecture might be abandoned. Its effect in scenery was very beautiful, and it might be applied with considerable success to the exterior of dwelling houses, and advantageously to prisons, barracks, and similar buildings. The subject had not perhaps been sufficiently considered.

The Chairman observed that he had only objected to the erection of modern fortresses, with battlements, loop-holes, and guard-houses, things which were not required in the present day. Such portions of a building, as doors or windows, which were necessary in all stages of society, might, of course, be executed in the Mediæval as well as any other style, with equal propriety.

Mr. Donaldson said, that the Duke of Northumberland, before adopting the Italian style, had satisfied himself that the restoration of English castles in accordance with the Mediæval style, from Windsor Castle downwards, had been a failure throughout. Not feeling satisfied with any of these restorations, his Grace considered whether any other style might be adopted, and he considered that the palaces of Rome of the 15th and 16th centuries appeared most consistent with our own habits and usages, especially as he was about to build on the large scale of those palaces, which was not generally the case in modern English works.

Mr. Ashpitel, Fellow, said, that it should be borne in mind, that the Duke had not to deal with anything like a Mediæval building which could be at all restored, but with one which had been actually ruined nearly a century ago. The works of that period were indeed so thoroughly bad that restoring them to their original state was totally impossible. Possibly the meeting might have entertained the idea that his Grace, having a perfect Mediæval building, had converted it into a classical one, which was far from being the case. The possessor of a true Mediæval castle should rather preserve it from decay, and apply it to such uses as it was really fit for, and, if he wished for an Italian residence, he should build it somewhere else, and carry it out in its integrity. Whatever notions might be entertained of the merits of different styles, it could not be doubted that a medley was always bad.

Mr. M. D. Wyatt suggested that, inasmuch as the Duke possessed a large collection of heir-looms, in the shape of modern pictures, he might properly have considered that they could not be shown to advantage in any room but one of a comparatively modern aspect.

The Chairman.—If the heir-looms referred to were at all connected with the Hotspurs and other early ancestors of his Grace, they would look better in a Mediæval room.

Mr. C. Fowler, jun., Associate, expressed his concurrence in the view taken by Mr. Pocock, as to the choice of the Italian style. Decoration generally in the present day was scarcely in a satisfactory position, as constituting any actual style of the period. Very few satisfactory specimens of revived Mediæval decoration could be found, and still fewer examples of ancient Mediæval decoration, and the Duke of Northumberland had therefore to choose between such a Mediæval style of decoration as he might be able to get, and the Italian style of decoration, which was ready made to his hand. Another material consideration might have been that, besides the original style of Italian decoration, there existed now a revived style of it, which had been carried into execution with great success in Italy and other countries.

The CHAIRMAN proposed the thanks of the meeting to Mr. Donaldson and Mr. Salvin. He concurred with the former in rejoicing to see a work of the great Canina in England, but he heartily wished it had been carried out at Northumberland House or Sion House, instead of Alnwick Castle.

Mr. ASHPITEL and Mr. DONALDSON adverted to the liberality and zeal of the Duke of Northumberland, in establishing with so much success, a school of art amongst the workmen of the north.

The vote of thanks was carried unanimously, and the Meeting adjourned.

ON THE VARIOUS METHODS, NOW BEFORE THE PUBLIC, OF INDURATING AND PRESERVING ARCHITECTURAL STONEWORK.

By C. H. Smith, Hon. Member.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, Dec. 1st, 1856.

Some years since the late A. W. Pugin pourtrayed, in his "Contrasts," the difference between numerous Mediæval and Modern edifices. That ingenious critic might, with equal propriety, have drawn a parallel between the present condition of the buildings of the ancient Assyrians, Egyptians, Greeks, Romans, and British people; he might even have included the Architectural works of London, previous to the beginning of the present century; nearly all of which, so far as the stone is concerned, are in a very perfect state as contrasted with many of the buildings recently erected in this country. The Architectural and Sculptural works of Nineveh and Athens, which are two or three thousand years old, are much less decayed than the stonework composing the Eastern Façade of Buckingham Palace, before it had been erected a thousandth part of the time. It may he said that the question is one of £. s. d., but all Architects specify and contract with the Builders, that "the whole of the materials are to be of the best quality of their respective kinds," and therefore when a client employs a Builder to erect a magnificent structure, he ought not to expect it to be in a perishing condition, like the Palace of our Sovereign, before its completion. When the Government ordered the enlargement of Buckingham Palace, it certainly did not entertain the most remote idea that Her Majesty would be inconvenienced by scaffolding, and a host of workmen to repair the defective stonework immediately after its erection; nor that, when repaired, the expensive process of oiling and painting would be resorted to, to avert the progress of decay in the new Caen stone, rapidly mouldering away.

I believe that the knowledge of the most fit and proper materials, according to circumstances, for constructing the exterior of our ornamental edifices, is better understood at this time and in this country than at any former period amongst any civilized people; yet, with all our advancement in art and science, the art and mystery of obtaining good and durable stone for our decorated Architecture never was in so low a state, and never was allowed to be so improperly practised. No material is so durable as always to retain its first appearance; the most solid and compact rocks have not such a degree of impenetrability, nor so close a union of the parts which compose them, as to be exempted from ultimate dissolution; there is scarcely a substance which does not exhibit proofs of "weathering," after having been exposed to the action of rain and atmospheric influences for a considerable time; it may be observed even on Granite and the most densely compacted siliceous rocks. The stonework of many beautiful buildings of recent date is in a worse state of external decay than that of others, which have borne the vicissitudes of summer and winter during six or seven centuries; in some bodies these changes are not so frequent and remarkable as in others, though equally certain to take place at a more distant period. Sooner or later all stone will decay; but whether the ruin be effected in ten years, or in ten thousand, is only a question of relative duration, somewhat in proportion to the labour of appropriation to useful or ornamental purposes, as the parts may be exposed to the weather either in large or small masses. The same influence is for ever at work, to bring about the disintegration, decay, and final dissolution of all things.

Of all the causes of decay in stone, none are more destructive than variations of temperature;

causing disintegration of the crystals or grains from each other by mechanical means. The vicissitudes of heat and cold, and of dryness and moisture, frequently alternating, are more ruinous to the carved parts of a building than either of these extremes constantly operating. However slight the additional heat may be to which a body is subjected, it will expand under its influence, and contract when the temperature is lowered. The thermometer will probably vary 100 degrees from the severe frost of a winter's night to the direct rays of an afternoon summer's sun, which never shines upon the north or north-east sides of a building, except very obliquely at rising and setting; but the south and west fronts have the same degree of cold as the north and east during the night, with the additional warmth of meridian splendour daily. Such extremes must tend to loosen the component parts and separate many small fragments from the surface, especially if the mass be made up of different substances, in which case some will expand and contract more, in proportion to their size and density, than others. The test of time proves this to be correct, for in almost all cases the greatest amount of disintegration has taken place where the inequalities of temperature are greatest.

Rain facilitates decomposition, or separation of the molecules by chemical means. If the stone happens to be of a quality likely to be disintegrated by frequent changes of temperature, and to be decomposed chemically through the influence of rain, it will very rapidly moulder away, should both these causes operate at the same time, or nearly so; by no means an unusual occurence.

An eminent political writer has remarked, that the very best laws are but necessary evils; because if everybody would do what is right and proper, there would be no necessity for laws of any kind. By the same mode of reasoning, if builders would do what they engage to do, and what is right, there would be no necessity for contrivances to prevent good stone from perishing; because no materials but those of the best quality would be used in the erection of a building. This refers especially to cases where a building has been erected with stone, supposed to be good enough to show no important symptoms of decay during a reasonable period, say the lifetime of the proprietor, the architect, or the builder. But to the annoyance of all parties, before the edifice has been eight or ten years in existence, large portions of the stonework may be gradually crumbling away; as is the case with the Ionic entrance to Hyde Park from Piccadilly, constructed with Portland stone; and the exterior of Henry VIIth's Chapel at Westminster, refaced with Combe Down, Bath stone. Such indeed is the lamentable prospective state of the latter building at this time, that there is every probability of its being, within thirty or forty years, in the same dilapidated condition as it was before the repairs in the year 1808, unless some plan be speedily adopted to avert the decay which I have repeatedly observed, with extreme regret, rapidly advancing on the exterior, in consequence of stone of an inferior quality having been used in its restoration. It appears therefore to me, that Henry VIIth's Chapel will afford an excellent opportunity to test the merits of the different inventions for preserving stonework; as there can be no doubt that the progress of decay is very far advanced in that beautiful structure.

Buildings constructed with first class stones, as Portland, Anston, and the best sandstones, ought not to require the aid of indurating processes to render them durable. No one ever thought of preserving the stone of St. Paul's Cathedral, of Greenwich Hospital, or of other public buildings erected in London during the eighteenth century. There is scarcely a trace of decay in the Portland stone of the Post Office, the National Gallery, or the Royal Exchange; whereas the lower part of the river front of the Custom House, the Ionic Entrance to Hyde Park from Piccadilly, and a few other buildings erected about thirty or forty years since, with a very inferior quality of Portland stone, are certainly in a decayed and dilapidated condition. The best specimen, in London, of Anston stone similar to that used at the Palace at Westminster, may be seen in the two elevations of the Museum

of Practical Geology in Jermyn Street, and in Piccadilly. There is also an excellent specimen at the Amicable Life Assurance Office, No. 50, Fleet Street, the elevation of which is not extensive, but the stone is remarkably free from decay. The worst specimen may be observed in nearly the whole of the new buildings at Lincoln's Inn.

In all stone quarries, especially those occupying extensive districts, there are variations in the texture, hardness and durability of some of the beds, which may account for the stone from certain beds being more readily disintegrated when exposed to weather; thus rendering it objectionable for ornamental Architecture. In the Houses of Parliament, some such defective stones have been injudiciously used; but the proportional quantity of inferior stone in the entire edifice being small as compared with that of a good and durable quality, shows that the failures have arisen entirely from inadvertency, or the want of a more careful supervision of the blocks of stone, and of the particular beds from which they were obtained.

The first stage of decay in the Anston stone appears in spots of a lighter color than the general surface of the stone; these enlarge and unite until, in some cases, the whole surface acquires at a distance a pale yellowish brown tint. Upon closer examination, on the face, or more correctly speaking under an exceedingly thin film on the surface, there seems to be a sort of disruption of the particles, overcoming their cohesion, and a powdery incoherent light colored surface is the result. This is easily rubbed off, and it may probably, though not certainly, continue to increase in depth; for some few stones in the Houses of Parliament present unequivocal evidence of the surface having undergone a certain amount of decomposition, or disintegration, since they were finished by the workmen; but this progress of decay appears now to be at least retarded, if it be not altogether at an end. Upon this principle, it is possible that in many other cases the present mouldering appearance of certain stones may, at no very distant period, altogether cease.

It would be too much to expect so enormous a quantity of stone, or other natural product, to be all of a quality fit to receive the most refined elaboration, and without any defects; but a question may arise, whether there be more imperfect stone in the construction of the grand edifice just mentioned, than if some other well chosen stone had been used; Portland, for instance, than which no better material for such a purpose can be named; yet we find buildings constructed with this stone in various stages of preservation, some nearly perfect after being erected probably more than a century; but others mouldering away, only a few years after their completion, merely from want of proper care in selecting the material. These remarks will apply to the stone used at the Parliament Houses, but there are buildings in London and elsewhere, constructed with stone from the identical quarries which have furnished the material for the great work at Westminster, which present scarcely a trace of decay, while the surface of others, erected more recently, is to the eye even of the casual observer in a rapid state of disintegration.

The British Isles contain unbounded supplies of building stone, probably as good as any in the world. As it is usually on the surface of the ground in almost every stone district, it may be readily quarried at very little cost, and may generally be transported at small expense to any part of the kingdom. With these advantages, a foreigner might expect to find perfection in stonework in all our towns; our public and other buildings noble illustrations of this source of national wealth, proofs of the skill of our masons and carvers, and of the genius and refined taste of our architects, remaining from century to century in good preservation, deriding alike the frigid rains and scorching solar rays, without need of reparation. This however is, we all know, by no means the case; London and every other large town in our Island abound with examples of material badly selected, improperly exposed, often carelessly worked, and generally discreditable. I readily admit that there are numerous

exceptions, but the rule is as I have stated; little or no pains are taken to learn the true relative value of different materials, but to save a small proportion of the first cost, some cheap stone is probably selected for Public as well as for Private Edifices; magnificent Club Houses, Royal Palaces, Churches, Chapels, and Cemetery buildings, that were intended to last many centuries, are constructed with the most perishable kinds of Caen or Bath stone; and thus, as time rolls on, we find ourselves surrounded with specimens, the greatest use of which now is, to serve as a warning for our future conduct.

Suppose a building to be erected with Caen, Bath, or some other soft cheap stone, that can be worked very expeditiously, and afterwards be hardened and rendered, at a very small additional cost, indestructible by weather and atmospheric influences; this sounds very tempting, and is no doubt a desirable object to attain. But it should be borne in mind, that the quality which gives Caen or Bath stone a preference among architects and workmen, the facility of working it, also contributes in a great degree to the speedy obliteration of its beauty when exposed to the weather; unless therefore the object can be successfully accomplished, the result must be a failure. There can be no difficulty whatever in rendering small specimens of soft stone completely weatherproof; but, as with numerous other projects, I foresee almost insurmountable difficulties in carrying out such contrivances upon a large scale, so that they can be practically applied, and completely answer the intended purpose in such buildings as the Royal Exchange, or the Palace at Westminster. Among other important advantages, the invention and mode of procedure should be commercially valuable; otherwise the cost of an edifice erected with soft stone, and afterwards indurated, may be greater than if the most durable stone had been employed in the first instance.

It is well known that water, even in its simplest state, acts as a solvent on most things; but when it contains acid, its power of dissolving calcareous substances is considerably augmented. The most perishable kinds of Caen, Bath, or Reigate stone, may be used for decorative purposes in the interior of buildings, where they are protected from the influence of rain or dampness, and may remain for centuries without showing any tendency to decay; but if the same stones should be exposed to the weather, all architectural features would be obliterated in the course of twenty or thirty years. The main object therefore to be attended to, in order to preserve stone from decay, is to protect it as much as possible from the influence of moisture, and especially from frequent alternations of wet and dry.

If water be one chief cause of the decay of stone, we must endeavour to saturate the stone with some solution that will repel the water, and thus become the means of conservation. Some years ago, the late Mr. Silvester suggested a process for the preservation of stone, cement, and brickwork. It was a solution of soap in the first instance, and afterwards a solution of alum. This plan seemed to answer very well at first, as the water thrown on the specimens flowed off without leaving a trace behind; but the effect entirely disappeared after a time, and the stone became as absorbent as ever. Another scheme has been tried within the last few years, under the sanction of several gentlemen, eminently distinguished for their chemical attainments. A solution was prepared by dissolving flinty sand and potass in boiling water, and called "Silicate of Potass" or "Water Glass;" with this the surface of stone buildings was to be saturated. It had long been known that animals and vegetables had the power of dissolving Silica in water; but it is only within a few years that the chemist has learnt to imitate nature in this respect, and to form an aqueous solution of flint. The acquisition of one really new idea in science is likely to give birth to others of far greater importance, and this "water glass" gave promise of the most successful results. Specimens of Caen stone and other soft materials, *soaked* in a solution of "water glass" in the laboratory of the Royal Institution, under the very able direction of the Rev. John Barlow, were very perceptibly indurated after a time, and

resisted the action of water and of dilute acid; but having made a similar experiment, in the most careful manner, in the month of January 1849, upon a piece of Caen stone, which I knew to be of a perishable quality, and placed it on the roof of a building by the side of a piece of the same stone in its natural state, where they have remained until this morning, in order that they might be fully exposed to the action of the atmosphere and the climate, I now find that the silicated specimen and the unsilicated one are both in the same condition and equally corroded.

Some caution is necessary before experimenting on a specimen of finished work, because few fluids will remain neutral while in contact with stone; they will either preserve it, or in some degree decompose it. Their chemical action should consequently be accurately ascertained by well directed investigations.

Most of that numerous class of substances, which are of an oily or resinous nature, are insoluble in water, having little or no affinity for it and generally repelling it; they may therefore be useful in protecting other bodies from penetration by rain or moisture. It is well known that if wood is properly painted, or saturated with linseed oil, or linseed oil varnish, it will not readily decay or rot, but will remain unchanged in the damp earth, or exposed to the weather, as long as the oil continues to be of a fatty or greasy nature; whereas the same timber, in the same situation, rapidly becomes rotten without some such preparation. Nearly all the vegetable fats, which have the property of drying or hardening when exposed to the atmosphere, such, for example, as linseed oil, lose their unctuous consistency after a time, probably by evaporation, and dry up so completely as to leave nothing but a trace of resinous, waxy, or gummy matter. It is therefore absolutely necessary, in order to preserve wood from decay, to repeat the oiling or painting process every three or four years.

The first step towards investigating a subject scientifically, is to generalize the materials, and argue upon first principles. Without entering upon a controversy as to the merits of the various patented and other inventions for attaining the objects now under consideration, the remarkable similarity of each separate process, when compared generally with the others, is rather surprising. All the vehicles named in the specifications of the patents are composed of mixtures of oily, resinous, or bituminous substances. Now it is well known, that although the various oils differ from each other in certain respects, there are yet principles in them which seem to be common to all. Nearly every variety of fat and oil, whether of animal or vegetable origin, either the hardest tallow, the soft greasy fat of a horse or a goose, or the volatile oil of turpentine, may be separated into two distinct substances by compression or by cold. As regards fats and fat oils, that is those which do not readily harden and dry, one part, the oleine, will remain fluid, while the other part named stearine, at the same temperature, becomes solid; and this solid portion, in its chemical relations, is closely allied to wax. The volatile and essential oils, such as oil of turpentine, become thick by exposure to the air, and in time assume the character of resin. Bitumens gradually pass from a state of fluidity into one of viscidity and solidity. A long time is necessary to produce this alteration by the atmosphere only, but if heat be applied, distillation will carry off the fluid portion, and solidification will be much more rapid. Naptha, petroleum, mineral tar, pitch, asphaltum, shellac, and a certain portion of coal, appear to have had all the same vegetable origin, and vary but little in their elements and constitution from each other.

The following analytical table of substances of an oily or resinous nature, beginning with caoutchouc, which contains the largest proportion of carbon in 100 parts, and arranged successively as the quantity of carbon diminishes, will show that, notwithstanding the various oils and resins differ so much in appearance, they are all composed of a mixture of only three elements—carbon,

hydrogen, and oxygen—and many of them are compounded in very nearly the same proportional quantities :—

	CARBON.	HYDROGEN.	OXYGEN.	
Caoutchouc	90.000	9.120	.880	100.000
Pitch	88.700	9.700	1.600	100.000
Oil of Turpentine	84.311	10.449	5.240	100.000
Naphtha	84.187	13.300	2.513	100.000
Wax	81.094	12.085	6.821	100.000
Tallow	79.420	11.580	9.000	100.000
Spermaceti Oil	78.303	11.491	10.206	100.000
Olive Oil	77.210	13.360	9.430	100.000
Linseed Oil	76.014	11.351	12.635	100.000
Asphaltum	75.000	9.900	15.100	100.000
Resin	74.773	11.809	13.418	100.000
Ether	66.475	14.125	19.400	100.000
Alcohol	52.175	13.500	34.325	100.000

The most conspicuous difference exists in the various temperatures at which the substances above-named become solid or fluid; for instance, most of the oils remain in a liquid state at the usual ordinary temperature of our climate, but at the freezing point, or a few degrees lower, they become solid. Pitch, wax, resin, and tallow are usually hard and compact, but melt at a degree a little above summer heat. These remarkable differences must be evident to a casual observer, yet I think I may venture to assert, that the most learned philosophers are not yet able to explain to a certainty why the same elements, united in the same proportions and at the same temperature, should give liquifaction in one case, and solidification in another. It is also well deserving of notice, that all these substances appear to be, as it were, of one family, possessing a sort of chemical affinity, or general good feeling for each other's company; for example, if we take any two substances named in the foregoing table, and put them together at a certain temperature, they will unite and form one homogeneous body; still further, I am of opinion, that if the whole collection were to be thrown into a cauldron, placed over a gentle fire, there would soon be a hotchpotch of a uniform texture, somewhat resembling treacle in appearance. There might be individual exceptions, but I believe the rule would be as I have stated.

Many plans have been practised, or tried experimentally, by different persons during the last few years, in order to get over the necessity and expense of oiling a stone building periodically, for the purpose of averting the progress of decay. To generalize and describe these contrivances in a few words I may say, that the patentees have found that oil, in its simplest state, applied in sufficient quantities to saturate the surface of stone, loses by evaporation nearly all its protective influence in a few years; they have therefore adopted the plan of charging the oil with an additional quantity of the solid portion of the same, or of any other kind of oil, such as a mixture of oil and wax, resin and turpentine, or of naptha and shellac. During the process of saturating a porous stone with any of these mixtures, the fluid holding the solid wax or resin in solution acts as a vehicle to carry the wax or resin, by capillary attraction, into the interior of the stone; and after the fluid portion has evaporated, the solid which remains serves two purposes; it protects the stone from external wet and moisture, which always tends to decompose soft lime-stone; and then the solid wax or resin serves to cement the grains more firmly together, and thus changes what was previously a fragile absorbent substance into a compact stone, impervious to moisture, so far as the indurating mixture has penetrated.

The first patent for indurating and preserving stone which I shall notice was granted to François Teychenne, a foreigner, residing abroad; it is dated February, 1847; it afterwards became the property of William Hutchison. I believe the works are now carried on at Tunbridge Wells, and the patent belongs to the "Indurated Stone Company." In general terms the operation may be thus described: the stone to be indurated must be worked to the requisite form, then thoroughly dried in a heated chamber, or by some other convenient method. The solution, in which the stone is to be immersed, is composed of resin dissolved in turpentine, oil, wax, tallow, or other fatty substance; the materials are to be melted in a boiler of suitable size, and while they are in a state of ebullition the stones are put in, and the operation of boiling is continued until they are impregnated to a sufficient depth from the surface; in ordinary cases two hours boiling will impregnate the stone one inch.

The next invention for a similar purpose, patented by Barnabas Barrett, is dated October 1853: it is now worked in the name of "The London Stone-Hardening and Preserving Company;" their office was at 41, Moorgate Street. The following is Mr. Barrett's mode of procedure: the stones to be indurated are first completely worked to their required form, then placed in a chamber or oven, which is heated from 50 to 60 degrees, to drive out whatever moisture they may contain. In all cases where it is practicable, the stones are to be operated upon in an air-tight chamber, exhausted, or partially so, and then the indurating mixture, whether hot or cold, is allowed to trickle down or flow into the chamber to fill the vacuum; the effect of which will be that the liquid indurating substance will readily find its way into the pores of the stone, and become incorporated therewith. Mr. Barrett's indurating mixtures are classed under six varieties:—the first is composed of resin dissolved in naptha, spirits of wine, or turpentine, mixed with gutta percha, dissolved in coal tar naptha, and when warmed with steam heat, mixed with oil or any other greasy materials; after which "anti-corrosia" is ground down and well mixed with the above. Another mixture is composed of unslacked lime, with oil or soft soap, and Russia tallow, mixed with it whilst slacking; when well slacked to be placed in a copper with alum water and "anti-corrosia," ground-up copperas and a solution made from potatoes, and beer settlings: when well boiled and mixed together, they are left to settle, and the solution is drawn off. These various preparations are rather complicated, I will therefore not occupy more time by going further into Mr. Barrett's inventions.

The next patent for the same purpose, granted to John Benjamin Daines, is dated April, 1856. The specification describes the invention as "An improved mode of treating surfaces of soft and porous stone, &c. for the preservation of the same from decay." Mr. Daines' chief object is to impart to the exterior surfaces of stone or compo buildings, the power of resisting the destructive effects of the atmosphere and of damp; and in some measure to neutralize the tendency to alkaline efflorescence. To produce these results, he first applies a solution of sulphate of zinc or a solution of alum; after which, sulphur dissolved in linseed or other oil. This mixture is to be laid on the surface of buildings, or building materials, by the aid of a brush, or by means of an exhausted case applied to the wall of the building, or by any other suitable means; the stone will then be impervious to moisture.

Mr. Henry Clinton Page took out a patent, dated May 1856; part of which is for "indurating common stone work generally," for this purpose he dissolves bees wax in coal tar naphtha. But if the color of the stone be very delicate, or the preservation of its natural color be desired, Mr. Page substitutes double distilled camphine in place of the coal tar naphtha, and white wax instead of common bees-wax. The solution is to be applied with a brush to the surface of the stone, repeating the process as often as the stone will absorb it, and until the pores are completely filled therewith; using the solution thicker for coarse grained than for fine grained stone.

Having given an abstract of four distinct patents for attaining the same object, I will now en-

deavour to give a general view of the mode of operating, and of certain practical difficulties attendant thereon. Every one practically acquainted with the working of stone, whether as a mason or a carver, must be well aware of the time occupied, and of the liability to damage incurred in removing heavy masses of elaborately wrought stone after the work is finished; and that the risk of injury or breakage is far greater with soft than with hard stone. In several of the patented inventions, it is expressly stated that the stones, after being completely worked, are to be thoroughly dried in a hot air chamber, or oven; and in one instance it is stated, they are afterwards to be put into a tank of boiling solution, and boiled for several hours; in another method the stones are to be put into an air-tight chamber, exhausted, or partially so, and then filled with the indurating mixture, either hot or cold. I need scarcely state that it is an utter impossibility to exhaust, even partially, a vessel capacious enough to hold the largest stones that are generally used in a first class building. The failure of the atmospheric railway, on the Croydon line, arose entirely from the impracticability of exhausting large vessels, as it was found impossible to make them anything approaching to air-tight. If the stones are to be completely immersed in the indurating mixture, there will be great waste, as no other part than that which is to be exposed to the weather need be indurated; in fact the joints, beds, and back being covered with an oily or resinous substance, will prevent the mortar or other aqueous cement from adhering properly to the stone; and the result must be a certain amount of weakness in a building so constructed.

Among the writings of various patentees I find the remarkable statement, that "the process gives to the most porous stone, the hardness of primitive granite." It will be unnecessary to expatiate on this imaginary result—we will look upon it as the infatuation of a parent for his offspring. The same patentee attributes the decay in stonework to alkaline efflorescence, arising from the cement or mortar used in the walls; he has arrived at this conclusion after a variety of tests and trials during eleven years. These are assertions, but no proofs are offered. The gentleman has no doubt seen many examples of stone in an advanced state of decay, covered with a saline or alkaline efflorescence; but is he prepared to show, by experiments, that the same stone would have remained perfectly free from disintegration, had it been situated far from the influence of what he conceives to be destructive agents. I have submitted a piece of limestone, which I knew to be of a good and durable quality, to the most severe tests of both salts and alkalies, trials far more powerful than anything likely to occur to stone in the ordinary course of nature, yet with all such violent experiments, I have never been able to produce more than a mere trace of alteration or disintegration; I am therefore disposed to believe that the salts and alkalies have little or nothing to do with the decay of stone. Among the published writings of patentees I find also this remark, "in many cases the decay of stone is accelerated by the employment of sea or salt sand; a proof of the destructive effects of salt upon stonework, may be observed in any sea port town." No doubt the author has observed stonework in some sea port towns in a deplorable state of decay, many of the buildings at Brighton, constructed with Portland stone, are in this condition; but we have no "*proof*" offered that such decay is occasioned by marine influence. The surface of the masonry of most of the buildings at Oxford is so decomposed, that it is peeling off like paper or rags. Had this beautiful city been erected with the same stone, on the sea coast instead of the interior of the country, many might have imagined, that the wretched condition of the stonework was entirely owing to the destructive effects of sea salt, whereas it is the result of bad stone.

The Island of Portland is only five or six miles in circuit; of course it is surrounded on all sides by the sea; it contains seven villages, all built with Portland stone, and they are in an excellent state of preservation. But the most remarkable instance, which proves that sea salt has no effect whatever

on good stone, is that of Sandysfoot Castle, near Weymouth, built with Portland stone in the time of Henry VIII. It is so close to the sea, that every high tide washes the lower part of the walls, and in stormy weather the building is completely overwhelmed by the spray, yet the stone is quite perfect, and the chisel marks are as fresh as when left by the workmen. The fact is, *good* stone will remain nearly perfect in any situation, during almost an indefinite period; whereas *bad* stone, if exposed to the weather, will rapidly moulder away, whether placed on the sea shore, or in the middle of a large continent. The four patents which I have described, may be classed under one general heading, because they all recommend oily or resinous mixtures to be applied to the stone in a somewhat similar manner.

I have one more invention for a similar purpose to offer to your notice, which has been reserved on account of the indurating mixtures being of an aqueous and more scientific character, and therefore differing essentially from any of the others. The inventor, Mr. Frederick Ransome, has sent me the following particulars: "The process consists in the employment of two or more separate solutions, which, by mutually acting upon each other, produce within the pores of the stone an indestructible mineral precipitate. In operating, the stone may either be immersed in, or saturated on the surface with, a weak solution of silicate of soda or potash; and afterwards with a solution of chloride of calcium or barium, when an insoluble silicate of lime, or baryta, is formed in the pores of the stone, rendering it impervious to moisture and insusceptible of injurious effects from atmospheric influences. Or instead of a silicate of potash or soda, a solution of sulphate of alumina may be employed, and then by an application of baryta, a compound of sulphate of barytes and alumina is produced."

Any of the before named mixtures, whether oily or watery, will readily be absorbed into the pores of a newly worked piece of stone; but after a building has been erected a few years in London, or any other large town, its surface becomes so thoroughly grimed with dust, soot, and impurities of a populous neighbourhood, assisted, in no small degree, by powerful winds and driving rains, that the indurating mixture cannot easily be made to soak in; it will run off the surface of the stone as it would off glass, or other nonabsorbent material. But if, by some contrivance, it can be made gradually to enter within the pores, if the building should have been erected only a few months, the dirt will be so difficult to remove, that a large portion of it must unavoidably be mixed with the indurating materials, and the result will be a dirty, disagreeable appearance, permanently given to the entire edifice. Were it not for the soot and dirt, the oily mixtures applied to lime-stone would be so far blanched in about a year, as to cause the stone to be rather whiter than if no such process had been applied to it. To overcome these objections, some have suggested that the entire surface of the stonework should be scoured, scraped, or even chiselled afresh, in order that the indurating material may have uninterrupted access to the substance of the stone. This proceeding would not only be very expensive, but it would be liable to alter the character and effect of the mouldings, carvings, and decorations generally; and as the projecting parts are usually the first to show symptoms of premature decay, they would therefore require the greatest amount of induration. Unless the indurating fluid can be made to soak into the stone, at least half an inch, it may be worse than useless; because, in all probability, wet will get in behind the hardened surface, and thereby occasion larger portions to exfoilate than if the stone had been left in its natural state.

I may now offer a few comments on the manner of testing the merits of these patented inventions. You have already heard mentioned some extraordinary contrivances of air-tight chambers, and baking and boiling building stones to render them imperishable; such performances, upon samples like those shown to me by the patentees, are quite within the bounds of possibility; but it would be a novelty to see the Parliament Houses first placed in an oven and then in a tank of boiling liquid.

If, therefore, the desired object cannot be effectually accomplished by such means; if the stones cannot be properly protected from the effect of atmospheric influences, without treating them in the manner described, the inference must be, that if a building is merely brushed over a few times with a cold solution, the result will certainly be ineffectual; if the former plan be a sure one, the latter must be very doubtful. Taking all circumstances fairly into consideration, I am of opinion that no plan for indurating and preserving architectural stonework is likely to answer the intended purpose, unless it can be applied after the building is erected, and after the mouldings and carvings are completely finished. Then comes the question, how to know what is the best material, and how is it to be successfully applied. I have seen multitudes of small specimens of indurated stone, which while fresh certainly resist the decomposing influences of air and water; but as the patentees and inventors offer no proofs whatever that the same or such pieces of stone would have rapidly mouldered away, had they not been preserved by their indurating process, how am I to know that the same pieces of stone would not have stood the weather equally well without their application? and I believe, up to this time, no one is prepared to show what condition their specimens will present after eight or ten years' exposure to the weather. I am not disposed to listen with credulity to the opinions or testimonials of individuals, however high their position — however numerous the Roman capital letters may be at the end of their names—unless they have something to relate and to show upon the subject of a more evident and satisfactory character than anything I have heretofore heard or witnessed. No doubt some may consider me captious, over scrupulous, and determined not to believe what I either see or hear; but the *weekly list of Patents*, which are taken out for supposed inventions or improvements, most of which are neither seen nor heard of afterwards, shows how many men there are, who, although they do not always deceive other people, are often very successful in deceiving themselves, by believing they have discovered an invention, of great public utility, which is to "*yield* 200 *per cent. profit*," and which golden prospect their fondest admirers can neither see nor comprehend.

It would be a good plan to try the conservative power of a solution on two or three specimens of stone—Caen, Bath, and Portland for instance—choosing pieces of their respective kinds, well known to be of a perishable quality. I am sorry to say that in London there will be no difficulty in procuring such specimens; each piece to be between two and three feet long, and of sufficient girth to be accurately worked into a few mouldings, such as a piece of cornice, When the working is completed, let each piece be broken (not sawed) in the middle lengthwise, so as to leave clean fractures, with abundant indentations; the two parts will fit each other, without the possibility of either being counterfeited. Let only one piece of each specimen be well prepared with the indurating solution, taking care not to use more or less of the fluid, in proportion to the size of the specimen, than would be used if a large edifice were to be prepared for conservation; then place the prepared and unprepared specimens of each kind of stone side by side, on the top of some elevated building, were they will be fully exposed to all weathers, during several years, more or less according to circumstances. We know beforehand that in course of time the unprepared pieces will show evidence of decay; but if the indurating process answer the intended purpose, if the stones have absorbed the fluid sufficiently deep from their surface to be the means of rendering them durable, the prepared portions ought to be found after a few years unaltered, and comparatively in a perfect state, while their couterparts, having been subjected to precisely the same variations of climate, would perhaps be in an advanced stage of decay, and their architectural features nearly obliterated. Experiments thus performed and recorded would be valuable, because they would prove, as nearly as possible, whether eventually a certain process might be serviceable or useless, or indeed injurious to the stone-work.

During the last twenty or thirty years I have had many conversations with several of the most learned chemists about preserving stone from decay, and have listened with attention to the remarks of intelligent and experienced practical stone-masons, for much gold is sometimes contained in the roughest ore; and a clear operative mechanic, though incapable of expressing clearly that which he conceives in his mind distinctly, will, by judicious questioning, state facts, likely to lead the studious man into a train of ideas which he otherwise might not have thought of. But after all, the object in pursuit seems to be as far off as when I commenced the inquiry; in truth some years ago I thought I knew more of the subject than I do at present; the difficulties appearing to increase as more information is collected. All the methods of induration which are now before the public are merely mechanical mixtures with the stone, a sort of fluid cement or varnish, which surrounds the grains without altering them, although to a certain extent it glues them together, and partially keeps out moisture: but each individual grain continues in the same state, no chemical change whatever has taken place, the elementary constitution of the stone is the same as it was before the indurating material was applied to it. It is a characteristic feature in quarries of oolite that the stone procured from the uppermost beds is generally, perhaps invariably, of a durable quality; whereas the lowest beds are the first to decay, when exposed to weather. The cause of this difference is known to depend chiefly on the quantity and quality of the cementing substance, by which the particles adhere to each other. The cement that unites the globules into a mass is formed of the same elements as the globules themselves, but more crystalline; it is in fact the decomposition of the superincumbent mass, saturating and crystallizing within the beds beneath. But this natural process of indurating is not performed in a day, nor in a year, but in ages; so slow or gradual is the progress, that in scarcely any case is the lowest bed so hard, or so thoroughly saturated with the crystalline material, as those above.

It seems to me, that if we could pursue, or imitate this natural process, it might lead to the best means of improving the natural condition of soft stone; or, in other words, we might finish the stone which is imperfectly formed in the rocks; Nature not having had time to complete her work. Man can command Nature in no other way than by obeying her laws; in all our experiments or performances, it is not we who operate, but the laws of Nature which we set in operation. The durability of compact carbonate of lime, in a crystalline state, either in the form of stalactites, or that of a porous material, rendered dense and durable by impregnation, may be witnessed in numerous instances in this country, especially in the petrifying caverns of Derbyshire. In the South of Italy and in Sicily, the production of excellent building stone, entirely formed by deposition from water, has been going on abundantly, from the earliest ages of the world to the present time. The Temples of Pæstum, constructed more than two thousand years ago, with aqueous deposit from the neighbouring rivers, are still but little decomposed, so far as the stone is concerned. Most of the modern buildings in Rome, including St. Peter's, which are constructed with a similar material, Travertine stone, or Calcareous Tufo, are generally in excellent condition.

In the waters which produce these petrifactions, there must be some solid body as a nucleus to begin upon, but what constitutes it, is in no respect important; any substance will do for the waters to commence their petrifying works upon; hence, at the caverns, "*the wonder seeker*" is invited by the guides, to purchase birds' nests, purses, and various other articles, said to be changed into stone; whereas, in fact, the objects themselves are merely encrusted with stony matter. Although this natural process is progressing now, and has been during all ages, and, to a certain extent, is well understood by chemists and others, yet it has not been applied to any important purposes, and certainly never to artificially indurating and preserving soft stone. If we could successfully imitate nature in this respect, and apply our efforts to the purpose now under consideration, I think they

would be more likely to answer than any plan heretofore attempted. It is not in my power to tell you how to proceed, but the principle appears so clear and simple, that I am induced to believe the proper mode of application would soon be found, if scientific men would turn their attention in that direction.

The necessity for preserving the stonework of our buildings from premature decay is entirely an evil of modern date, which, in nearly all cases, ought not to exist; for if builders engage in a legal contract to use the best materials of their respective kinds, they are liable to an action for damage, if it can be proved, that defective stone has been introduced into a building; as such a proceeding must be an imposition, if not a direct fraud, upon those who have to pay for the work. And I believe I am correct in stating, that pleading ignorance of the laws of this country is not considered an excuse for the violation of those laws; and that therefore, in all probability, a verdict would be given against the contractors.

With reference to the proceedings for indurating the stonework of the New Palace at Westminster, I fear the parties in authority are rather premature in their decision. Several experimenters have been set to work without investigation or enquiry; without ascertaining which plan is best, or whether their mode of procedure may or may not be injurious to the stonework, or likely to prevent the success of some other treatment which may hereafter be found superior. With every sentiment of respect for the judgment and general discrimination of the noble and learned Lord, who has lately taken so much interest in this matter; I trust he will forgive me, if I entertain the idea, that his lordship has yet much to learn, before he can properly adjudicate and decide on matters relating to the decay and preservation of stonework at the Parliament Houses.

If there ever was a time, when a knowledge of good and bad stone was of considerable importance to the British Public, that time is now arrived. Our Government is contemplating the covering of more than twenty acres of ground, at Westminster, with official buildings of a palatial character; it is therefore to be hoped that the subject of our attention this evening will apply only to the times past and present, and that in future, when a magnificent structure shall be completed, the external masonry may remain unimpaired during the lives of those who were at the cost of erecting it, without the expense and annoyance of scaffolding, saturating, discolouring, and many other vexatious incidents attendant on the endeavour to make the best of a discreditable affair.

The Chairman, Mr. Ashpitel, Fellow, said he believed that, as architects, they might consider it their own fault that stone-work so often failed, as it was conceded that England had as good stone as any country in the world. Perhaps the first cause of failure was the want of sufficient care in selecting stone. He had noticed the care taken in this matter in the restoration of Southwell Minster: it was well known that there were in all quarries both good and bad beds of stone, and the selection should be made in the quarry itself. The durabillty of St. Paul's Cathedral might be ascribed to the precaution taken by Sir Christopher Wren, who, as soon as the stone was quarried, had it exposed upon the sea-shore for three years before it was used. This could hardly be termed seasoning, as stone was a very different kind of material from wood; but the effect was that, after exposure to the weather, the perfect blocks were easily distinguished from the defective ones, and only those which had stood the weather well were worked. He had been told that Sir Robert Smirke took a somewhat similar precaution at the new Post Office. Unfortunately few masons or clerks of works understood the bed of the stone; as in addition to the oolitic construction of some stones, pointed out by Mr. Smith, every kind of stone in England, excepting Portland, had the further characteristic

of a visible cleavage or bed, and if placed in a building on its wrong bed, the stone would not stand. This was the principal cause of the failure of many buildings of Bath and Caen stone. Granite when improperly bedded, failed from the decomposition of the feldspar; and in some parts of Waterloo Bridge the stones appeared as if gnawed into by the weather. From some experiments made by Mr. Freeman, it appeared that in Portland stone there was not any visible bed or cleavage. The workmen were commonly in the habit of turning about the blocks of Caen stone in order to find the bed,—the softest side being the under-bed. He quite agreed with Mr. Smith that alkalies would not injure stone, but they all knew that acids did to a great degree, and consequently the sulphurous acid in the London atmosphere had a corroding effect upon stone-work. Mr. Smith had not referred to the method of preserving the monuments in Westminster Abbey, adopted by Mr. Gilbert Scott, the architect to the fabric. Some of these were of Purbeck marble, and in a sad state of disintegration. Mr. Scott was so careful of these monuments that he would hardly suffer a brush to touch them; but in order to keep the body of the stone together, he directed a solution to be made of the most colourless lac and spirits of wine, and the dust having been blown from the surface of the stone with a large pair of bellows, the mixture was applied by means of a garden syringe with a fine rose. How long this method would prove effectual he could not say, but as it was very cheap, and did no injury whatever, it was worthy of attention.

Mr. Burnell, Associate, read a communication from M. Viollet-le-Duc, describing the process of silicatization adopted by him at Notre Dame, Paris. Mr. Burnell added that he had been over the works at Notre Dame, where M. Viollet-le-Duc pointed out to him the experiments he had made. He had himself tried the process at St. Luke's, Chelsea, where the stone had become very hard indeed. He had also broken up and powdered some Farley Down Bath stone, and mixed it with the silicate of potash, and when that was absorbed, he silicated the mass again. This was two years ago, and recently he boiled a portion of the composition in water for an hour, and could not discover that it discharged any salt. He again boiled it in a solution of potash, and could not discover that the mass was altered, or that there was any free silica; thus proving, as he thought, that the silicate of lime was formed. He agreed with M. Viollet-le-Duc that the success of the process depended upon the stone upon which it was tried: the great mistake in the experiments which had been made at the House of Lords, two years ago, was that they took place in the month of November, when the stone was so damp that it could imbibe nothing, and consequently the experiments could not succeed. Mr. Smith's impression was that one application of the process was sufficient, but on the contrary it was essential that it should be done day after day; that the superfluous salt should be all washed out, and a sufficient quantity of silica introduced to form with the lime an insoluble material—the silicate of lime.

Mr. Brandon, Fellow, suggested that the subject was sufficiently interesting and important for an entire evening's discussion, and that it was therefore desirable to adjourn it to a future meeting.

Mr. M. D. Wyatt, Hon. Sec., thought that, as many gentlemen would be desirous to take part in it, it would be desirable that any communication respecting the various processes, and their cost, which might be sent to the Council, should be digested into as short a compass as possible, and that the Council should exercise their discretion in reducing the length of such communications.

The evening on which the discussion should be resumed having been left to the decision of the Council, the Meeting adjourned.

ON THE LEADING PRINCIPLES IN THE COMPOSITION OF ORNAMENT OF EVERY PERIOD, FROM THE GRAMMAR OF ORNAMENT.

By Owen Jones, Fellow.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, Dec. 15th, 1856.

Ornament is the result of an innate desire in man to produce for himself forms of beauty, in imitation of the works of nature by which he is surrounded: he sees everywhere that the Creator has made all things not only useful, but beautiful, and he in turn desires to create.

There is scarcely a people, in however early a state of civilisation, with whom this strong desire does not exist. It is absent in none, and it grows and increases in the ratio of their progress in civilisation.

It is to this feeling that we must ascribe the tattooing of the human face and body, resorted to by the savage to increase the expression by which he seeks to strike terror on his enemies or rivals, or to create what appears to him a new beauty. As we advance higher through the whole range of civilisation, from the decoration of the rude tent or wigwam to the sublime works of a Phidias or a Praxiteles, the same feeling is everywhere apparent. Man's highest ambition is to create, to stamp on this earth the impress of an individual mind.

From time to time a mind, stronger than those around it, will impress itself on a generation, and carry with it a host of others following in the same direction; yet never so completely as to destroy the individual ambition to create. Hence the formation of styles, and the modification of styles.

Ornament, with every people, precedes the development of every other form of Art. Architecture, one of the earliest, adopts ornament, does not create it. As we find that to ornament is, with every people, one of the first natural instincts; so we shall find, that in the exercise of this instinct they could not do otherwise than follow natural laws.

The ornament of a savage, being the result of a natural instinct, is necessarily always true to its purpose; whilst in much of the ornament of civilised nations, the first impulse which generated certain received forms being enfeebled by constant repetition, the ornament is oftentimes misapplied. And instead of first making the most convenient form, and adding beauty, all beauty is destroyed, because all fitness, by superadding ornament to ill-contrived form. If we would return to a more healthy condition, we must even be as little children, or as savages: we must get rid of the acquired and artificial, and return to and develope our natural instincts.

It would be far beyond the limits of the powers of any one individual to attempt to gather together illustrations of the innumerable and ever-varying phases of Ornamental Art. It would be barely possible if undertaken by a government, and even then it would be too voluminous to be generally useful. All, therefore, that I have proposed to myself in forming the collection which I have ventured to call the *Grammar of Ornament*, has been to select a few of the most prominent types in certain styles closely connected with each other, and in which certain general laws appeared to reign independently of the individual peculiarities of each. And it will be my endeavour to show, that in all the varying phases of Ornamental Art these leading principles are the same as those which every work of nature displays.

I have ventured to hope that, in bringing into immediate juxtaposition many forms of beauty which every style of ornament presents, I might aid in arresting that unfortunate tendency of our

time to be content with copying, whilst the fashion lasts, the forms peculiar to any bygone age, without an endeavour to ascertain, generally completely ignoring, the peculiar circumstances which rendered an ornament beautiful, because it was appropriate, and which, as expressive of other wants, when thus transplanted, as entirely fails.

It is more than probable that the first result of sending forth to the world this collection will be seriously to increase this dangerous tendency, and that many will be content to borrow from the past those forms of beauty which have not already been used up *ad nauseam*. It will be my endeavour to arrest this tendency, and to awaken a higher ambition.

By endeavouring to search out the thoughts which have been expressed in so many different languages, we may hope to find an ever-gushing fountain in place of a half-filled stagnant reservoir.

In the prosecution of this work, and in the study of ornament, I have gathered these main facts:—

First. That whenever any style of ornament commands universal admiration, it will always be found to be in accordance with the laws which regulate the distributions of form in nature.

Secondly. That however varied the manifestations in accordance with these laws, the leading ideas on which they are based are very few.

Thirdly. That the modifications and developments which have taken place from one style to another have been caused by a sudden throwing off of some fixed trammel, which set thought free for a time, till the new idea, like the old, became again fixed, to give birth in its turn to fresh inventions; changes in the general character of ornament which are analogous in their results to organic changes in architecture, such as the substitution of the arch for the horizontal beam by the Romans, and the pointed arch of the Normans for the round arch of their predecessors. They have the same influence in the history of Art as the sudden discovery of a general law in science, or the lucky patented idea which, in any work of industry, suddenly lets loose thousands of minds to examine and improve upon the first crude thought.

Lastly. I will endeavour to show that the future progress of ornamental art may be best secured by engrafting on the experience of the past the knowledge we may obtain by a return to nature for fresh inspiration. To attempt to build up theories of art, or the formation of a style, independently of the past, would be an act of extreme folly. It would be at once to reject the experience and the accumulated knowledge of thousands of years. On the contrary, we should regard as our inheritance all the successful labours of the past, not blindly to follow them, but simply as guides by which we may find the true path.

We have, then, first to consider what are the laws of form which we find in nature, and which are universally obeyed in all those archaic periods of art of which the works command, and ever will command, the admiration of the world.

If we examine any work of nature—a man, an animal, a tree, a flower,—we shall at once see that, independently of the beauty which results from the fitness of any part for the duty it has to perform, there is another beauty superadded which bears the same relation to the general structure that ornament does to the architectural members of which it forms a part. It is, in fact, ornament. There is no necessity for the covering of the muscles or the bark of a tree to assume the beautiful form which nature has given to it, still less for the decorative beauty superadded, both of surface, ornament, and of colour, except to satisfy certain faculties which the Creator has implanted in us. Man, besides his intellect, possesses sentiments and affections, and the delight we experience in looking upon any work of perfect beauty results from all these faculties being thoroughly satisfied, leaving the mind in a state of repose. We therefore lay it down as an axiom.—

1. That true Beauty results from that repose which the mind feels when the eye, the intellect, and the affections, are satisfied from the absence of any want. This test may be applied to ornament in many ways.

Egyptian ornament was not only constructed in a way to satisfy the eye by the beauty of its form, the mind by the propriety of its application, but also as a religious symbol it appealed to the sentiments and affections. It was complete in itself, and the mind of the beholder was in as perfect rest as when looking on its natural type. Egyptian constructive ornament was always symbolic: the column only a few feet high, or one forty or sixty feet, as at Luxor or Karnac, was an enlarged papyrus plant; the base representing the root, the shaft the stalk, and the capital the full-blown flower, surrounded by a bouquet of smaller plants, tied together by bands. Not only did a series of columns represent a grove of papyri, but each column was in itself a grove; and we find on the walls of Egyptian buildings representations of groves of papyri in various stages of growth, which would only have to be assembled as they stand, and tied round with a string, and we should have the Egyptian shaft, with its highly ornamental capital. Egyptian art, although the oldest, is, in all that is requisite to constitute a true style of art, the most perfect. The language in which it reveals itself to us may seem formal and rigid, but the ideas and the teachings it conveys to us are of the soundest. All other styles approach perfection only so far as they follow, in common with the Egyptians, the true principles to be observed in every flower that grows. Like these favourites of Nature, every ornament should have its perfume,—*i.e.* the reason of its application. It should endeavour to rival the grace of construction, the harmony of its varied forms, and the due proportion and subordination of one part to the other found in the model. When we find any of these characteristics are wanting in a work of ornament we may be sure that it belongs to a borrowed style, where the spirit which animated the original work has been lost in the copy.

Greek ornament, not being a symbol possessing only beauty of form and fitness of application, leaves a want, which is only supplied when the ornament is used as an accessory to painting and sculpture. The Moors and Arabs, on the contrary, being debarred from these adjuncts, but possessing the same refined instincts as the Egyptians, by interweaving with their ornaments inscriptions appealing both to the highest faculties and sentiments, obtained that same repose which we find in every work of nature, however humble, and which we hold to be the first condition of a work of art.

2. Again we never find in nature any superfluous ornament: there we always find construction decorated, decoration never purposely constructed. When an ornament is constructed falsely, appearing to give support which it does not, it fails to engender the feeling of repose by neglecting to satisfy the intellect, however much its beauty and other charms may appeal to the eye and the affections. This law, so constantly violated in modern times, was universally obeyed in all the best periods of Art. The Egyptians and the Greeks always obeyed it; as did likewise the Arabs, Moors, Indians, and even the Chinese. With the Moors especially,—not only does all their ornament obey this law of decorating construction, but the constructive idea is carried out in the details of the ornament itself. The Romans, the artists of the Renaissance, the Italian, and the later Gothic periods, equally disregarded it. We derive farther, from observation of Nature's works, another proposition, viz. that—

3. Beauty of form is produced by lines growing out one from the other in gradual undulations; there are no excrescences, nothing could be removed and leave the form equally good or better.

There is nothing more characteristic of true art than the gradual undulation of form. In nature all transitions of curved lines from curved, or of curved lines from straight, are gradual. There is

nothing abrupt, and this is the feature which distinguishes in all things, the elegant and refined from the coarse and vulgar; it is the property of pure form, either in rest or in motion.

The gradual undulation of form is the secret of success in Greek art; the want of it is the sign of the decline of the Roman. It was possessed by the Gothic artists of the thirteenth century, and even by those of the Renaissance, but it lasted with them only for a time.

With Michael Angelo and his followers commenced a new era. Grace of outline and delicacy of undulation were abandoned for boldness of conception and wonderful fertility of execution, which, whilst appealing more strikingly to the intellect and the senses, left unsatisfied the more refined instincts and the affections. The same change took place in ornament; from the delicate relief and modulation of the Renaissance artists, those of the sixteenth and seventeenth centuries returned to the coarser modelling of the Romans. The refinements which the early artists obtained by a return to nature for fresh inspiration were gradually forgotten, and ended in a style which for want of a name has been called the Rococo. In modern times a return to a more moderate relief was obtained in this country by the works of Adams, Flaxman, and Sir John Soane; but it took but slight root, and the great rush upon Roman architecture in the time of George the Fourth, deluged the country with ornament outrivalling in coarseness all Roman models, and ended in a state of disorder, in the misapplication and imperfect modelling and drawing of ornament, from which we are now but slowly recovering. The artists of France have been kept within bounds. Percier and Fontaine exercised a similar influence in France to our Adams here—an influence, which from the more general academic system in France, has not been lost sight of; and the abundant studies of so many French artists in Italy have resulted in forming in France a style of ornament which borders on the other extreme, and from its flatness often verges upon insipidity.

If we examine the leaf of a plant or a tree, we shall find that, independently of the beauty of the general form, there is another beauty which arises from the exquisite way in which all the lines on the surface are distributed over its area.

However varied the general outline of the leaf, it will be found to be arranged in masses, the areas of which always diminish in regular proportion. Up the centre of each mass is a main sap-feeder; and as the object clearly is to distribute the sap to the extremities of the leaf in the readiest way, however varied the form, the main sap-feeders will divide the masses into proportionate areas. Every portion of these spaces is again subdivided in the same way; with such perfection, that the skeleton of a dissected leaf presents the appearance of a series of graduated tints in which there is no break.

Now we shall find in all decorative ornament of the best period that this natural law has been instinctively obeyed, not only in the distribution of form on the individual ornament, but also in the general arrangement of a group, and we therefore venture to lay down as an axiom that, in the composition of ornament,—

4. THE GENERAL FORMS SHOULD BE FIRST CARED FOR; THESE SHOULD BE SUBDIVIDED AND ORNAMENTED BY GENERAL LINES; THE INTERSTICES MAY THEN BE FILLED IN WITH ORNAMENT, WHICH MAY AGAIN BE SUBDIVIDED AND ENRICHED FOR CLOSER INSPECTION.

The Greeks were most happy in their recognition of this law; but the Moors, perhaps, have more fully carried it out. With them ornament adapts itself so perfectly to the general form which encloses it, that it as often would appear to have suggested, as to have resulted from it.

5. We observe also another natural law in the works of all the Oriental nations, that in their surface decoration ALL LINES FLOW OUT OF A PARENT STEM; EVERY ORNAMENT, HOWEVER DISTANT, CAN ALWAYS BE TRACED TO ITS BRANCH AND ROOTS.

6. ALL JUNCTIONS OF CURVED LINES WITH CURVED, OR OF CURVED LINES WITH STRAIGHT, SHOULD BE TANGENTIAL TO EACH OTHER.

Nature is said to abhor a vacuum; it may equally be said she abhors an angle. In the whole range of her vegetable productions it will be impossible to find a line butting on another line, every branch of a tree, every stem of a leaf, every vein upon the leaf, is always softened at the point of junction with another by a re-entering curve. This also is a natural law universally obeyed in the best periods of art, equally violated when art declines. It is always present in Greek ornament, often absent in the ornament of Pompeii.

Another universal law which may be recognised in every work of nature, and which should be observed in every assemblage of forms, as well as in each simple ornament, is, that whenever we recognise perfect harmony in any composition, it will be found that the straight, the inclined, and the curved, are properly balanced and contrasted. When any of these forms are wanting, the eye is as much disturbed by an unsatisfied want as when, looking on any composition of colours, any one of the three primaries is absent. In all the geometrical patterns of the Egyptians and all the Mohammedan races this is especially cared for, as well as by the Greek and by the Gothic architects in all their structures. It is daily and hourly neglected in modern times. It is one of the most serious faults in the decoratioos of the interiors of houses, and absolutely fatal in articles of costume, where lines are constantly running in one direction uncorrected, and as constantly tending to destroy the repose of the forms which they are designed to decorate and develope.

We have thus seen that the natural laws of decorating construction, the gradual undulations of form, proportionate division and subdivision of general masses; the radiation from a parent stem, tangential curvature of lines; the balancing and contrast of the straight, the inclined, and the curved, are universally obeyed in every perfect work of ornament.

I will now endeavour to show, in the second place, that HOWEVER VARIED THE FORMS WHICH HAVE BEEN GENERATED IN THE SEVERAL STYLES OF ORNAMENT IN ACCORDANCE WITH THESE GENERAL LAWS, THE LEADING IDEAS ON WHICH THEY ARE BASED ARE VERY FEW.

The ornament of Egypt is founded on few types, and these natural types. The lotus and papyrus, growing on the banks of the Nile, symbolising the food for the body and mind; the feathers of rare birds, which were carried before the king as emblems of sovereignty; the palm branch, with the twisted cord made from its stems; these are the few types which form the basis of that immense variety of ornament with which the Egyptians decorated the temples of their gods, the palaces of their kings, the coverings of their persons, their articles of luxury, or of more modest daily use, from the wooden spoon which fed them, to the boat which carried their similarly adorned embalmed bodies across the Nile to their last home in the valley of the dead.

In Greek ornament the types are still more limited; the honeysuckle and the acanthus are as universal as the lotus and papyrus with the Egyptians. There is much, however, of Greek ornament which is rather constructed on the general principles which reign in all plants, than representing any particular plant. The laurel, ivy, and vine are sometimes used as borders on vases surrounding pictures, and may be said to be in such cases symbolical; but as a general rule they were not so, and must be considered simply decorative features, which would have afforded but little satisfaction in themselves when deprived of the pictures to which they were the adjuncts.

The Romans, through the Greeks, adopted the acanthus almost exclusively. Their carved ornaments are always modifications of the acanthus; in the painted decorations the acanthus forms the groundwork on which are engrafted representations of natural plants and flowers.

There is no form which has taken such deep root as this acanthus leaf, and this we think because

it contains within itself all the true principles of ornamentation. The Romans, however, were limited in the use of it by the fixed law that each acanthus leaf grew out of another; but when this law was abandoned in the Byzantine period, it led to the formation of continuous scroll-work, which is so common in the MSS. of the twelfth and thirteenth centuries. The artists of the Renaissance, in returning to the acanthus, returned also to this law of its use; and, like the Roman, all their ornaments grew one out of the other.

In the ornament of the thirteenth century, again, there are but few typical forms. The most endless variety of combinations of foliage is produced by a repetition of trefoil and cinquefoil leaves, which have scarcely any particular relation to any natural plant, but being constructed on true principles are necessarily beautiful. In the later Gothic period, as a much greater approach to Nature was attempted, a greater variety of types were used; but the ideal representation formed on a recognition of a natural principle was far beyond, in effect, the result obtained by the imperfect attempt at the natural. In violating consistency in the application, all true beauty was lost.

In the purely conventional ornament of the Oriental nations, it is still more remarkable how few are the generating forms.

The secret of success in every work of ornament is the production of a broad general effect by the repetition of a few simple elements; variety should rather be sought in the arrangement of the several portions of a design than in the multiplicity of varied forms.

I have now to call your attention to some of these sudden changes in each style which have been the cause of so much development in architectural forms.

The religious laws of the Egyptians forbade any change in their generally received forms, and there is the most remarkable unity of style over a period of probably many thousand years. This, however, did not necessarily result in uniformity; and although the lotus and papyrus always formed the types of the capitals of their columns, there was the greatest variety in the arrangements of these types. In the Pharaonic period, however, they were generally confined in the capitals of columns of large diameter to the bell-shape, on which were inscribed the representations of the lotus and papyrus; and in the smaller columns to the bundle of buds tied together and surmounted by a square abacus. During the Greek period, however, this was suddenly departed from, and the idea arose of breaking up the circular form of the capital; the same forms which had before been carved from the surface were here moulded on it; and beginning with the circular form, they surrounded it with four, eight, and then sixteen other circles. This principle once admitted, it will be seen how readily the general form could be varied. As an opposite example to this may be noticed the Corinthian capital, which to our own time has never varied, because no modification in plan has ever been attempted. It is always an acanthus leaf arranged round a bell-shaped vase; and the only difference ever found between one capital and another, results from the more or less perfection of the modelling of the leaves, or in the graceful, or otherwise, proportions of the bell. Let the same modification in plan be attempted with the Corinthian capital, and it could not fail to produce an entirely new order of forms, whilst still retaining, if such should be desirable, the idea of the acanthus leaf applied to the surface of a bell-shaped vase.

The development of Roman ornament again was restrained by the fixed law, that each acanthus leaf grew out of the other with a leaf folded back at the point of junction. During the Byzantine period this was gradually abandoned; and when once free from this, a most rapid development in flowing lines took place in the styles which succeeded, till we arrive at that freedom in ornament which is found in the architecture throughout the world during the thirteenth century. Though other causes have been assigned to it, I myself believe that the Ionic capital of the Greeks is only an

application of the volute form, which results from the common rope ornament of the Egpytians. The unwinding of a coil of rope would give the first idea to any people of the volute form, as the twisting of two strands of a rope would give the first idea of the spiral line. The volute of the Ionic capital is produced by repeating in opposite directions the very form which is the ground-work from which all Greek ornament springs. The egg-and-tongue moulding of the Greeks is clearly suggested by the cornices so common in Egypt formed by the pendent lotus. The conventional honeysuckle of the Greeks led in subsequent styles to the formation of ornaments similarly constructed, yet widely differing in general appearance.

But one of the most remarkable series of developments, and which are most easily traced, are those ornaments which result from the intersection of equidistant lines called frets. They are common to every people, and arise so naturally from their very first attempt at ornament, that it is not necessary that they should have been borrowed from each other: but there is such a remarkable series from the Egyptian to the Moresque, that it can hardly be doubted that they have been so. The Greek fret differs only from the Egyptian, in that the jumps are generally uniform, and they are the truest. So long as the idea remained fixed that they were formed by horizontal lines intersecting perpendicular lines, no great development could take place. When we have the simple meander, or one with a second line interlacing with the first, or a fret one under the other, or running in different directions, or back to back, or running round a square, we have exhausted all the combinations of which it is susceptible; but the instant we abandon the law of perpendicular lines intersecting horizontal lines, a rapid development takes place; the raking fret at once suggests to the Arabs to send diagonal lines in the opposite direction crossing the first. From this spring instantaneously the Moresque interlacing patterns; not content with this, the Moors saw that they could use the horizontal perpendicular, and diagonal lines in two ways, and they have therefore two varieties which produce patterns totally distinct in effect, though the same in principle; in the first, the divisions are equidistant diagonally, crossed by horizontal and perpendicular lines on each square; and on the other, the perpendicular and horizontal lines are equidistant, and the diagonal lines cross each alternate square. The number of patterns that can be produced by this system may be said to be infinite. The knotted work of the Celts differs from this system only in adding curved terminations to the diagonal lines, and may have either been developed in the same way or from the rope ornaments of the Greeks, which were also so common on Roman pavements.

The History of Architecture, as it is written in the monuments, is full of these changes. Architecture never rests; it either goes forward or backward, and runs, as it were, in a series of waves; when the highest point is reached, this is as a knife-edge: it cannot rest upon it, but descends to rise again under fresh impulse.

At present we are, as it were, in a troubled sea, on which the waves have been so tossed about, that they have lost all form; the impulse having gradually got weaker and weaker, we are gradually approaching a dead calm.

In any attempt at progress in art, European nations are under great disadvantages from the general want of unity which exists. In all ages but the present, architecture has been the expression of the religious feelings of the time; but since the Reformation separated the tie between religion and art, the world has become as Protestant in art as Protestant in faith. The artistic mind has indulged in the same liberty of selection for its worship of the beautiful, as is allowed to each human soul in its worship of the Creator.

If, therefore, we would seek for vitality in art, we must turn our attention to the nations who are still faithful to the creed which inspired their art.

This was clearly seen in the Exhibition of the Works of Industry of all Nations, in 1851, which was barely opened to the public ere attention was directed to the gorgeous contributions of India.

Amid the general disorder everywhere apparent in the application of art to manufactures, the presence of so much unity of design, so much skill and judgment in its application, with so much of elegance and refinement in the execution, as was observable in all the works, not only of India, bnt of all the other Mohammedan coutributing countries,—Tunis, Egypt, and Turkey,—excited a degree of attention from artists, manufactnrers, and the public, which has not been without its fruits.

Whilst in the works contributed by the various nations of Europe, there was everywhere to be observed an entire absence of any common principle in the application of art to manufactures,—whilst from one end to the other of the vast structure there could be found but a fruitless struggle after novelty, irrespective of fituess, that all design was based upon a syteu of copying and misapplying the received forms of beauty of every bygone style of art, without one single attempt to produce an art in harmony with our present wants and means of production—the carver in stone, the worker in metal, the weaver and the painter, borrowing from each other, and alternately misapplying the forms peculiarly appropriate to each—there were to be found in isolated collections at the four corners of the transepts all the principles, all the unity, all the truth, for which we had looked elsewhere in vain, and this because we were amongst a people practisiug au art which had grown up with their civilisation, and strengthened with their growth. Uuited by a commou faith, their art had necessarily a common expression, this expression varying in each according to the influence to which each nation was subject. The Tuuisians still retaiuing the art of the Moors, who created the Alhambra; the Turks exhibiting the same art, but modified by the character of the mixed population over which they rule; the Indians uniting the severe forms of Arabian art with the graces of Persian refinemcnt.

Deprived, then, as we are of the advantage of a common faith to inspire a common expression in art, does it necessarily follow that we have no hope of progress? Although we cannot have common ground of thought, is there any reason why we should not think rightly? is there no escape from the disorder which was so apparent in 1851? I think there is, and I firmly believe that it will be found as easy to originate as to copy, if we can only throw off the lethargy which hangs over us, and that discouragement which makes us consider the works of the past as final instead of relative truth. In this very matter, indeed, opinion changes so rapidly, that there is reason to believe that as each style usurps the place of honour only for a time, and then rapidly runs its course, the time will arrive when all shall have had a fair trial; we must then, in very despair of finding novelty, be led to look forward instead of backward.

Let us then, once for all, admit that each style of art which has appeared has worthily filled its appointed purpose. That no one has more claim to our attention thau another, except so far as it follows general laws, which laws will be as true in the future as they have beeu in the past, and will, therefore, be our safest guides in an ouward path.

Let us, then, accept the experience of the past as our inheritance, not rashly to squander it, but rather that we may add to the store.

I have attempted to show that, in all the best periods of art, all ornament was rather based upon an observation of the principles which regulate the arrangements of form in nature, than on an attempt to imitate the absolute forms of those works; and that whenever this limit was exceeded in any art, it was one of the strougest symptoms of decline: true art consisting in idealizing, and not copying the forms of nature.

I think it desirable to insist rather strongly on this point, as in the present uncertain state in which we are, there seems a general disposition arising to reproduce, as faithfully as may be possible,

natural forms as works of ornament; the world has become weary of the eternal repetition of the same conventional forms which have been borrowed from styles which have passed away, and therefore can excite in us but little sympathy. There has arisen, we say, a universal cry of "Go back to nature, as the ancients did." I should be amongst the first to echo that cry, but it will depend much on what we go to seek, how far we may succeed; if we go to nature as the Egyptians and the Greeks went, we may hope; but if we go there like the Chinese, or even as the Gothic artists of the fourteenth and fifteenth centuries, we should gain but little. We have already, in the floral carpets, floral papers, and floral carvings of the present day, sufficient evidence to show that no art can be produced by such means; and that the more closely that nature is copied, the farther we are removed from producing a work of art.

The pleasure we derive in contemplating the rude attempts at ornament of the most savage tribes, arises from our appreciation of a difficulty accomplished; we are at once charmed by the evidence of the intention, and surprised at the simple and ingenious process by which the result is obtained. In fact, what we seek in every art is the evidence of mind—the evidence of creative power—which all feeling as a natural desire within them, are satisfied when they find it developed in others. It is strange, but so it is, that this evidence of mind will be more readily found in the rude attempts of ornament of a savage tribe than in the innumerable productions of a highly-advanced civilization. Individuality decreases in the ratio of the power of production. When art is manufactured by combined effort, not originated by individual effort, we fail to recognize those true instincts which constitute its greatest charm.

Although ornament is most properly only an accessory to architecture, and should never be allowed to usurp the place of structural features, or to overload or to disguise them, it is in all cases the very soul of an architectural monument.

By the ornament of a building, we can judge more truly of the creative power which the artist has brought to bear upon the work. The general proportions of the building may be good, the mouldings may be more or less accurately copied from the most approved models, but the very instant that ornament is attempted, we see how far the architect is at the same time the artist. It is the best measure of the care and refinement bestowed upon the work. To put ornament in the right place, is not easy; to render that ornament at the same time a superadded beauty and an expression of the intention of the whole work, is still more difficult.

Unfortunately, it has been too much the practice in our time to abandon to hands most unfitted for the task the adornment of the structural features of buildings, and more especially their interior decorations.

The fatal facility of manufacturing ornament, which the revived use of the acanthus leaf has given, has tended very much to this result, and deadened the creative instinct in artists' minds. What could so readily be done by another, they have left to that other to do, and so far have abdicated their high position of the architect, the head and chief.

How, then, is this universal desire for progress to be satisfied—how is any new style of ornament to be invented or developed? Some will probably say, a new style of architecture must first be found, and that we should be beginning at the wrong end to commence with ornament.

I do not think so. I have shown that the desire for works of ornament is co-existent with the earliest attempts of civilisation of every people; and that architecture adopts ornament, does not create it.

The Corinthian order of architecture is said to have been suggested by an acanthus leaf found growing round an earthern pot; but the acanthus leaf existed as an ornament long before, or, at all

events, the principle of its growth was observed in the conventional ornaments of the Greeks. It was the peculiar application of this leaf to the formation of the capital of a column which was the sudden invention which created the Corinthian order.

The principle of the foliation, and even the general form of the leaves which predominate in the architecture of the thirteenth century, existed long before in the illuminated MSS.; and, derived as they were, most probably, from the East, have given an almost eastern character to early English ornament. The architects of the thirteenth century were therefore very familiar with this system of ornamentation; and we cannot doubt, that one cause of the adoption so universally of this style during the thirteenth century, arose from this great familiarity with its leading forms which already existed.

The floral style, in direct imitation of nature which succeeded, was also preceded by the same style in works of ornament; and the facility of painting flowers, in direct imitation of nature in the pages of a missal, induced an attempt to rival them in stone, in the buildings of the time.

The architectural ornament of the Elizabethan period is mostly a reproduction of the works of the loom, the painter, and the engraver. In any borrowed style, more especially, this would be so. The artists of the Elizabethan period were necessarily much more familiar with the paintings, hangings, furniture, metal-work, and other articles of luxury, which England received from the continent, than they would be with the architectural monuments; and it is this familiarity with the ornamentation of the period, but imperfect knowledge of the architecture, which led to the development of those peculiarities which distinguish Elizabethan architecture from the purer architecture of the Revival.

I therefore think I am justified in the belief, that a new style of ornament may be produced independent of a new style of architecture; and, moreover, that it would be one of the readiest means of arriving at a new style: for instance, if we could only arrive at the invention of a new termination to a means of support, one of the most difficult points would be accomplished.

The chief features of a building which form a style, are, first, the means of support; secondly, the means of spanning space between the supports; and, thirdly, the formation of the roof. It is the decoration of these structural features which give the characteristics of style, and they all follow so naturally one from the other, that the invention of one will command the rest.

It would appear, at first sight, that the means of varying these structural features had been exhausted, and that we have nothing left but to use either one or the other of the systems which have already run their course.

If we reject the use of the column and horizontal beam of the Greeks and Egyptians, the round arch of the Romans, the pointed arch and vault of the Middle Ages, and the domes of the Mohammedans, it will be asked, What is left? We shall perhaps be told that all the means of covering space have already been exhausted, and that it were vain to look for other forms. But could not this have been said in all time? Could the Egyptian have imagined that any other mode of spanning space would ever be found than by his huge blocks of stone? Could the Mediæval architect have ever dreamed that his airy vaults could be surpassed, and that gulfs could be crossed by hollow tubes of iron? Let us not despair; the world has not seen, most assuredly, the last of the architectural systems. If we are now passing through an age of copying, and architecture with us exhibits a want of vitality, the world has passed through similar periods before. From the present chaos there will arise, undoubtedly (it may not be in our time), an architecture which shall be worthy of the high advance which man has made in every other direction towards the possession of the tree of knowledge.

To return to our subject, how is any new style of art or new style of ornament to be formed, or

even attempted to be formed? In the first place, we have little hope that we are ever destined to see more than the commencement of a change; the architectural profession is at the present time too much under the influence of past education, on the one hand, and too much influenced by an ill-informed public on the other; but the rising generation in both classes are born under happier influences, and it is to them we must look for hope in the future. It is for their use that I have gathered together this collection of the works of the past; not that they should be slavishly copied, but that artists should, by an attentive examination of the principles which pervade all the works of the past, and which have excited universal admiration, be led to the creation of new forms equally beautiful. We believe that if a student in the arts, earnest in his search after knowledge, will only lay aside all temptation to indolence, will examine for himself the works of the past, compare them with the works of nature, bend his mind to a thorough appreciation of the principles which reign in each, he cannot fail to be himself a creator, and to individualize new forms, instead of reproducing the forms of the past. We think it impossible, if a student be fully impressed with the laws of the universal fitness of things in nature, with the wonderful varieties of form, yet all arranged around some few fixed laws, the proportionate distribution of areas, the tangential curvatures of lines, and the radiation from a parent stem, whatever type he may borrow from nature, if he will dismiss from his mind the desire to imitate it, and will only seek to follow still the path which it so plainly shows him——we think it impossible but that new forms of beauty will more readily arise under his hand, than can ever follow from a continuation in the prevailing fashion of resting only on the works of the past for present inspiration. It will require but a few minds to give the first impulse: the way once pointed out, others will follow, readily improving, refining upon each other's efforts, till another culminating point of art shall be again reached, to subside into decline and disorder. For the present, however, we are far enough removed from either stage.

I have been desirous to aid this movement to the extent of my power; and in the ten plates of natural leaves and flowers which accompany the examples of ancient ornament, I have gathered together many of those natural types which I thought best calculated to awaken a recognition of the natural laws which prevail in the distribution of form. But, indeed, these laws will be found to be so universal, that they are as well seen in one leaf as in a thousand. The single example of the chestnut leaf contains the whole of the laws which are to be found in nature; no art can rival the perfect grace of its form, the perfect proportional distribution of the areas, the radiation from the parent stem, the tangential curvatures of the lines, or the even distribution of the surface decoration. We may gather this from a single leaf; but if we further study the law of their growth, we shall see in an assemblage of leaves of the vine or the ivy, that the same law which prevails in the formation of the single leaf prevails also in the assemblage of leaves. As in the chestnut leaf, the area of each lobe diminishes in equal proportion as it approaches the stem; so in any combination of leaves, each leaf is everywhere in harmony with the group: as in one leaf the areas are so perfectly distributed, that the repose of the eye is maintained, it is equally so in the group; we never find a disproportionate leaf interfering to destroy the repose of the group. This universal law of equilibrium is everywhere apparent in every work of nature. The same laws prevail in the distribution of lines on the surface of flowers; not a line upon the surfaces but tends more surely to develope the form—not a line which could be removed, and leave the form more perfect; and this why? Because the beauty arises naturally from the law of the growth of each plant. The life-blood—the sap, as it leaves the stem—takes the readiest way of reaching the confines of the surface, however varied that surface may be; the greater the distance it has to travel, or the weight it has to support, the thicker will be its substance.

From the same cause it results, that the basis of all form in natural flowers is geometry; the

impulse which forms the surface, starting from the centre with equal force, necessarily stops at equal distances: the result is symmetry and regularity.

Who, then, will dare say that there is nothing left for us but to copy the five or seven-lobed flowers of the thirteenth century; the Honeysuckle of the Greeks or the Acanthus of the Romans,—that this alone can produce art? Is Nature so tied? See how various the forms, and how unvarying the principles. We feel persuaded that there is yet a future open to us; we have but to arouse from our slumbers. The Creator has not made all things beautiful, that we should thus set a limit to our admiration; on the contrary, as all His works are offered for our enjoyment, so are they offered for our study. They are there to awaken a natural instinct implanted in us; viz., a desire to emulate in the works of our hands the order, the symmetry, the grace, the fitness, which the Creator has sown broadcast over the earth.

Mr. I'Anson, Fellow, said, that in making any observations on the paper read by Mr. Owen Jones, the real difficulty arose from the *embarras des richesses* which he had put before the meeting. It was clear that in Mr. Owen Jones' mind the eternal principles of ornament were simple and perspicuous. He had, however, understood that gentleman to say, that in none of Nature's works were to be found any but constantly flowing lines. Mr. Owen Jones was so completely master of the subject, that his views were, no doubt, substantially correct; but, with a view of eliciting discussion, he (Mr. I'Anson) ventured so far to differ from this remark as to observe, that in the branches of trees very angular lines indeed were often found, yet still producing great beauty of effect. So also in the decorative works of modern jewellers, and in the ornamental engravings used for the marginal decorations of poetry, &c., the combination of angular with curved lines was often employed with excellent effect. Mr. Owen Jones had also touched upon a subject which might occupy the Institute for more than one evening's discussion—namely, the possibility of originating a new style of architecture. He (Mr. I'Anson), for one, thought that the human mind, in the course of a moderate period, achieved in abstract science as high a development as could be attained; and he did not think anything more than the styles which had gone before could be achieved. He, however, threw out this remark rather as provoking discussion, than as laying down any law upon the subject.

Mr. Owen Jones explained that he had only intended to say that Nature abhorred an angle, not *the angular*. However angular the leading lines of any natural production might be, there was always a curve at their point of junction. Modern artists too often forget the curve, and put the angle instead.

Mr. M. D. Wyatt, Hon. Sec., thought it was but right, in justice to Mr. Owen Jones, to state that what he had read to the meeting was but an instalment of his views on this subject; and if it should be thought that any of his remarks required further illustration, it might be expected to be found in his complete work. Mr. Owen Jones should be congratulated not only on giving to the Institute one of the most interesting papers which had been read for some time, but also on the completion of the "Grammar of Ornament," a work which would add to that celebrity which he had already attained. The profession were already indebted to Mr. Owen Jones for their minute acquaintance with the works of the Moors in the Alhambra, and for the best illustration published in England of the Illuminated MSS. of the Middle Ages. In those works Mr. Owen Jones had shown the germ of that cosmopolitan spirit which, in his present publication, had produced the union of fruits from all gardens. Mr. Owen Jones had clearly stated that, in order to produce beauty, both curved and straight lines should be combined. This could not be done without intersections. The science of the contrast of lines was as interesting a subject as the contrast of colours, because it was as impossible to bring one line to

impinge upon another in an opposite direction, without changing their mutual effects, as it was to contrast red with green, or blue with yellow, and to produce thereby no reciprocal results. He had no doubt that, in the expanded text of his work, Mr. Owen Jones would much more amply illustrate this point than he could do in the scope of his present paper.

The Chairman (Mr. Bunning, V. P.) said that, having listened attentively to Mr. Owen Jones' paper, he could not but express his delight at the great talent which it displayed. He was sure the members would all feel the same delight; and he trusted it would not be the last paper, full of good and sound sense, which Mr. Owen Jones would favour the Institute with. With regard to the use of ornament, he would only say that it should be either employed judiciously, or let alone altogether.

Mr. T. L. Donaldson, Hon. Sec. For. Cor., had great pleasure in proposing, especially as his friend Mr. Scott would have equal pleasure in seconding, the vote of thanks to Mr. Jones. He felt embarrassed, however, from the variety of topics embraced in Mr. Jones' paper. There was so much of instruction and of novelty in his remarks, that it was desirable to think and dwell upon them carefully and deliberately, rather than give expression to the ideas that arose in the mind at the moment. He concurred with Mr. Owen Jones that all ornament should be derived from nature, and also that in adopting natural forms, some conventionalism must be introduced. To merely copy any leaf, for instance, in stone or marble, would be incongruous and unsuitable to the material. The subject of imitation in art, in respect to painting and sculpture, had been ably treated by M. Quatremère de Quincy, who shewed how vulgar it was to copy literally natural objects. The highest effort of the mind, and the greatest proof of its creative power, was to be found, not in copying, but in the realization of certain impressions in a way that should not be different from that which nature had produced. In adapting any leaf or flower to the purpose of architectural ornament, some conventionalism must be used, not a mere caprice, but a good, sound, sensible, philosophical development, in order to make it answer the necessary purpose, and produce a similar impression to that of nature itself. Probably in Mr. Owen Jones' complete work this idea might be illustrated by taking any special plant, as the lotus of the Egyptians, the acanthus or the parsley of the Greeks. The lotus in particular afforded great variety of form for ornamental purposes, both in the leaves, the bud, and the expanded flower; and the Egyptians had most fully availed themselves of it. Mr. Owen Jones had touched upon a great number of other interesting topics, particularly the classification of ornament. He (Mr. Donaldson) thought that the Mediæval might with propriety be called the floral style, and the Elizabethan the geometrical. In the latter style, natural forms were copied in a most debased manner, and such as could not be put into comparison with the architecture of which it was supposed to be a revival. There were many other topics which arose out of Mr. Owen Jones' paper, but he should be ashamed to give expression to his immature ideas of them, and would therefore only beg to move the best thanks of the Institute to that gentleman for his valuable paper.

Mr. G. G. Scott, Fellow, said he should do very little more than to follow with an echo what his friend Mr. Donaldson had stated. The impression produced on his own mind by Mr. Owen Jones' remarks was not at all calculated to lead him to hazard any hasty expression of opinion. He would much rather carefully read what he supposed Mr. Owen Jones had put in print, and receive his instruction more maturely from such a second consideration of the subject. The only point on which he had intended to offer a remark had been anticipated by Mr. Donaldson; namely, the conventionalism of foliage. This was an excessively difficult subject, and it was hardly possible to determine the right principle. It might, however, be hoped that while each person earnestly worked in his own course they would get right in the end. The line of thought which he had himself generally followed, was based upon observing that during the Mediæval perod, up to a certain point, a purely conventional foliage was employed. This was not Nature conventionalized,—it was not derived from Nature at

all: it was derived by imitation from the earliest periods of antiquity; from the Assyrians through the Greeks and the Eastern Romans or later Greeks, and thence from the Byzantines and the early Gothic artists; and this process of imitation had led to the exquisitely beautiful style illustrated on the present occasion by the specimen from Stone Church, Kent. Many other specimens of the same era existed, which were as beautiful as conventional foliage could possibly be. In France, however, at the middle of the thirteenth century (and in England a little later, about 1280 or 1290), that conventional system was abandoned, and a very direct imitation of Nature was adopted; but it appeared to him that the success which attended the change was hardly such as to bear out Mr. Owen Jones' remarks. The instances of copying in the latter part of the fourteenth century, to which Mr. Owen Jones had referred, were not direct imitations of Nature, and were in fact very inferior to the earlier specimens. The leaf upon the capital from Ely Cathedral (one of Mr. Owen Jones' illustrations), had no prototype in Nature. In the Sainte Chapelle in Paris, Nature was imitated absolutely, and there the effect was infinitely superior to the works of the latter part of the fourteenth and fifteenth centuries. The question, however, whether this direct imitation was equal to the earlier and purely conventional foliage, was not so easily settled. He himself thought the absolutely conventional was the best. The great point to which he wished to call attention, was that nature was the only source from which they had a right to copy at all. Beautiful as the specimen from Stone Church was (and there were thousands of examples equally beautiful), it would be wrong to *copy* any of them, but if they could invent an equally conventional foliage, they would do right. Until this could be done, they should study nature and how to conventionalize it;—as Mr. Donaldson had said,—philosophically. No conventionalism could be excusable for which there was not a reason. If leaves were more beautiful than any other object for ornamental purposes they should be adhered to; but it was natural to suppose that as they were not intended for ornaments for capitals (although they might suggest beautiful forms), some adaptation of them was essential to suit their forms to the place and the material in which they were employed, and especially to make up for the want of colour which they possessed in nature, and which must always affect any imitation of them. The little lines and markings of a natural leaf were merely the result of colour, and this was necessarily represented in carving by relief, more or less prominent; and this mode of conventionalism formed a style by itself. Another system of conventionalism was that of making ornament absolutely flat, so as to destroy all idea of relief, both being equally reasonable and philosophical. He thought Mr. Owen Jones' remarks a little too sweeping in speaking against the direct imitation of nature; but he agreed most entirely with him in the results which he was aiming at.

Mr. Owen Jones in explanation, referred to drawings of columns and capitals from Wells and Ely Cathedrals. In the former, the leaves forming the capital appeared to spring from the combined shafts of which the pier was composed; whereas in the latter, the leaves were merely stuck on, and the more directly they imitated nature the worse was the effect. In the Egyptian columns and capitals, not only the natural forms were most gracefully conventionalized, but also the natural colours; the bloom of the lotus being rendered by the red and yellow margin to the form. Much might be done in the way of ornament by merely adopting any flower and endeavouring to forget the past.

Mr. Scott said, that in the use of leaves for ornament, two principles might be observed. In one case they might be used, as in the examples from Wells Cathedral and Warmington Church, in which they appeared to grow out of the shaft and support the abacus, promoting the fine effect of shooting upwards, which characterized Gothic architecture; and in the other case, the leaves were merely put on to architectural forms as a surface decoration. Both these methods were legitimate if properly employed, and both of them were illustrated in the Sainte Chapelle. He had great pleasure in most warmly seconding the vote of thanks to Mr. Owen Jones.

The vote was carried by acclamation, and the Meeting adjourned.

SOME NOTICE OF THE LATE JOHN BRITTON, F.S.A., HONORARY MEMBER OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS,

By M. Digby Wyatt, Hon. Sec.

Read at the Ordinary General Meeting of the Society, January 12, 1857.

Since its last meeting, this Institute, has suffered a notable loss in the person of its honoured Honorary Member, the late John Britton. It appears but due to his memory that, postponing for a short time all other subjects, the members of this Institute should take into their consideration the propriety of placing upon their minutes some brief record of their regret that one should have passed away from among them, whose life-long labours were dedicated to the illustration, graphically and historically, of those monuments which are at once our pride as Englishmen, and our noblest national models as architects. I have now, therefore, to ask your indulgent permission to bring a few circumstances connected with Mr. Britton's career under the notice of the meeting. The admirable biographical sketch which has appeared in "The Builder," written by one who followed to the grave last Thursday the "dear friend," in whose intimacy, unbroken for an hour, he had lived for some twenty years, has no doubt brought to the knowledge of the majority here present the salient features of a life of honourable toil, devoted to a worthy cause, and conducing to eminently successful results. I feel myself, therefore, absolved from alluding in any other than the most cursory manner to those early struggles, and that indomitable energy which changed the ignorant rustic into the elegant writer and brilliant speaker, whose society was eagerly sought by the most learned and noble of Church and State. The matter which specially concerns us is the influence wrought through the exercise of his energies upon the profession to which we have the honour to belong, and to that theme I purpose as far as possible confining myself.

John Britton was born in the year 1771, at Kingston St. Michael, near Chippenham, Wiltshire, of parents whose means enabled them to in no wise cultivate his natural abilities. Apprenticed by his uncle to a London Wine Merchant for six years, a complete barrier was opposed to progress in any other branches of knowledge than those within the range of an ordinary cellarman's acquisition. The liveliness of Britton's imagination however, and his inborn affinities for literary pursuits, led him through a series of struggles and vicissitudes to at length force for himself an opening into the world of letters. The acceptance by the Attic Miscellany of his first anonymous contribution to the columns of that periodical, and the friendship he formed in the person of Mr. Edward Wedlake Brayley, for one feeling his way already in the humblest walks of literature, fostered the rising passion. Finding employment in the compilation of song books and other trivialities for the notorious Fairburn, the Catnach of his day, he at length tried his "Prentice hand" on a volume in prose, on the subject of the lives and exploits of Cortez, Pizarro, and Columbus. He graphically describes in his autobiography the difficulties he experienced in the mechanical process of bookmaking, the analysis of authorities, the compilation and stringing together of facts and incidents, and the art of deriving suggestions from the writings of others, without sacrificing individuality and originality. Any confession of bewilderment on first encountering these difficulties is singularly interesting on the part of one, whose subsequent publications evinced an early and consummate tact in the very particulars that at first signally discouraged him. The success of his first volume engaged the attention of publishers of more standing and repute than Fairburn, and in 1801, he was employed by Mr. Wheeble, and Messrs. Vernor & Hood, to prepare for the press a work upon the "Beauties of his Native County." Written

in a more popular style, and more agreeably illustrated, than any previous work of an analagous nature had been, the Beauties of Wiltshire met with a large sale, and established such a reputation for the author's topographical acquirements and capabilities, that he was selected by Dr. Abraham Rees to furnish the whole series of articles in the department of British Topography for the great and well known Encyclopædia, the publication of which commenced in the year 1802. Britton's anonymous labours, in connection with Dr. Rees, were continued at intervals during many years, and he in all contributed not less than 800 quarto pages to the Doctor's admirable work.

Between the years 1805 and 1814 he carried on the publication of his great work "The Architectural Antiquities," which, with the fifth volume subsequently published, cost in getting up £17,092. The edition extended to 1300 copies, of which about two thirds were published at £28. 12s. and one third at £43. The "Cathedral Antiquities," in 14 volumes, commenced in 1814 and terminating in 1835, was his next important work, involving an outlay of upwards of £19,000.

The fifth volume of Antiquities, by far the best work (and one of the least successful) produced by Mr. Britton, was published between 1818 and 1826. His association with Pugin began in 1823, in the "Specimens of Gothic Architecture," and the success of that well known work induced them to undertake the "Architectural Antiquities of Normandy." They next took up "London," of which upwards of 1000 copies were sold. This, which proved an unsuccessful speculation, was the last of the series in which these distinguished men co-operated. Mr. Britton on his own account gave his attention to the picturesque elements of our English Cities, bringing out a volume upon that subject in 1830; in this work he first used, to any extent, woodcuts as an auxiliary. His last important effort was made in getting up the "Dictionary," an excellent work, on which the Author bestowed great labour, and which he much regretted his inability, through unforseen circumstances, to carefully revise in a second edition. It is singular that of all his literary essays the two which were most popular, accepting the largeness of the edition as a test of popularity, were on subjects altogether uncongenial, it might be imagined, to his ordinary predilections. Of his Lecture on Railways no less than 5000 copies were struck off, while of an octavo volume of 239 pages written by him in 1807, with the singular title of "The Pleasures of Human Life, or the Miseries turned Topsy Turvy," 2000 copies were printed. During his long and laborious life he wrote and published about 11,000 pages, he caused to be executed upwards of 1700 line engravings, and mainly occasioned and directed an outlay of the great sum of £115,000. chiefly in the illustration of National Art and Antiquities.

To estimate the value of John Britton's labours aright, we must remember that before his time popular topography was unknown. The ponderous volumes of county histories were valuable as record rooms, but useless as libraries. The text books—Gough's Camden, King's Munimenta Antiqua, Cox's "Magna Britannia," and Buck's "Castles," were heavy and opaque. The facetious Captain Grose was the leading antiquary, and Gilpin furnished a sample of the florid style of picturesque description of scenes and localities. Price, Knight, and Repton, did much to draw attention to other details than those of genealogies and the descent of hereditaments. Any thing however, like a fusion of the two styles had not been attempted at the period when John Britton commenced combining antiquarian with topographic description. The pictorial illustrations of our national monuments at the close of the last century were of the most loose and imperfect description. Since the careful prints of Hollar, scarcely any engravings of architectural subjects had appeared worthy of notice or reliance; and the early productions of the Antiquarian Society presented the only approximation to accuracy. James Basire, Rooker, and Lowry, were the fashionable engravers of such subjects, and John Carter, and Fowler, who illustrated stained glass and antient mosaics, almost the only trustworthy draughtsmen. It was mainly through John Britton's energy that a reformation was

effected. His activity and enthusiasm soon gathered about him all those rising men whose names are now so familiar to us. He saw from the improvements which had been effected, mainly by Stothard, and Heath, the engraver, the capabilities of copper plate engraving; and speedily brought to bear upon the long neglected antiquities of the Country, that artistic ability through the exercise of which they could alone be popularized. Samuel Prout, Frederick Mackenzie, Edward Blore, George Cattermole, W. H. Bartlett, R. W. Billings, Henry Shaw, and many more, were at various periods induced to bestow their earnest efforts upon the proper delineation of those views which were so successfully transferred to copper by the brothers, John and Henry Le Keux, aud other engravers, for the most part pupils of Basire. Public attention was captivated by the excellencies of the engravings of the Architectural Antiquities of the land, and the excitement which at first took the form of vague admiration, has in our time reached its happy consummation in profound investigation into the true principles upon which they depended for grandeur and effect, and in a wise and wholesome spirit of conservancy. For much of this, the country is deeply indebted to that friend we have so lately lost. His labours were incessant, his memory extraordinary, his system admirable, his clearness of understanding, and liveliness of fancy in no common wise vigorous, his affections warm, his habits exemplary. Had he been less honest he might have been far richer; had he been more selfish he would never have benefited his country as he unquestionably did. Were abundant time at my disposal, I could scarcely condense into an evening's discourse an enumeration of the great variety of subjects which engaged his active attention. It must be manifest, therefore, that John Britton's claims upon our gratitude are infinitely more weighty and numerous than words of mine can urge upon the present occasion. I can only sum up this hasty tribute to his memory by an expression of my confident belief that he was to this country infinitely more than that other great archæologist, whose loss we have had to deplore this session,—Canina—was to his. It may not be unsatisfactory to the Institute to know that Mr. Britton, who died January 1st, at the age of eighty-six, was followed to his grave by a deputation representing the Council of this body, and consisting of his old and valued friends, Mr. George Godwin, and Professor Donaldson, and your indefatigable Honorary Secretary, Mr. C. C. Nelson.

ON THE RUIN OF HEIDELBERG.

By E. I'Anson, Fellow.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, Jan. 12th, 1857.

Last Session I had the honour of reading in this room a Paper describing some of the principal Chateaux of the Renaissance period in France; and I have now to bring under your notice the well known Chateau of Heidelberg, a work of the same period in Germany. Besides the Belvedere on the Hradschin, at Prague, built in the latter half of the sixteenth century, the portico of the Town Hall at Cologne, 1569-1571, and the Town Halls of Augsburg and Nuremberg, both of the beginning of the seventeenth century, I am not aware whether that country contains many palatial monuments of that time and character; but if, as I believe, it is not so rich as France in this respect, this one monument is so fine and so well preserved as to afford an excellent opportunity of comparing it with buildings of similar character and the same age in that or other countries. As a picturesque ruin Heidelberg is highly appreciated by the many tourists on the Rhine; its beautiful situation, its perfect condition as a ruin, its rich deep tone of colour, its aspect embowered in thick woods, the towering background of wooded hills, the bold craggy base of rock, the quaint forms of the town of Heidelberg stretched out below, and the rich landscape which extends beyond westward to the valley of the Rhine, traversed by the noble river Neckar, all unite to excite in the mind those sentiments of romance which we experience in looking back to what has been, in contemplating the ruined monuments of our forefathers.

The landscape over which the eye wanders is classic ground, for the distance beyond the Rhine includes the rich flat alluvial plain in which the formerly important towns of Spires and Worms are situated; it is a district immortalized in the Niebelungen Lied, and the Minnesinger called it Wonnegau, or the Land of Delight,—another instance of the very different manner in which beauty of scenery was understood in Mediæval times. As to the ruin of Heidelberg itself there can however be no question; for certainly I never in any place saw so many artists, expressing their appreciation of the romantic interest of a locality, as might be fairly inferred from the numbers who were seeking to record on their tablets the beautiful effects of this noble ruin.

The building is still in its general features very perfect, and although quite a ruin, is in some parts so well preserved that there is enough to indicate its former well studied magnificence; it is yet so much of a ruin, and so indicates the rude agencies of war or time by which it has been partially destroyed, as to furnish abundant scope to the imagination, and in its mingled groups of ruined strength and graceful beauty to afford the most picturesque combination of form, light, and colour.

The carriage approach is by a winding road on the south side of the building. There were formerly outposts and two fortified outer courts to pass before reaching the gate. The entrance is over a narrow bridge through a gateway (in which the portcullis still remains suspended) into the inner court. But the more interesting approach is by a steep and picturesque path through a hanging wood, and thence through a subterranean part of the building to the north terrace, from which a partial view of the buildings, and a first impression of their characteristic architecture, are obtained.

The Castle of Heidelberg was built by the ancestors of the present reigning family in Bavaria. The first foundation of a castle at or near the locality dates back earlier than the fourteenth century,

and down to 1801 it was still held by descendants of the family by whom it was built, but at the Peace of Lunéville, it (together with the Palatinate of the Necker) was incorporated with the Grand Duchy of Baden. It is recorded that a certain Conrad von Hohenstauffen, brother-in-law of the Emperor Barbarossa, had his domicile near the site of the present castle in 1142; of this however all material trace has ceased to exist, it having been entirely destroyed, as its more modern successor has been ruined, by lightning firing a powder magazine, which it contained, in 1537. The foundation of the present building is attributed to Rudolph I., Count Palatine, who commenced it in 1319, and whose son continued the works. In 1329, at the Treaty of Pavia, the building is first conspicuously mentioned. In 1346 its then owner added a chapel since destroyed, he also formed the fine platform called the Galerie du Chateau, cut out of the hill side towards the town. Robert Count Palatine, who became Emperor of Germany in 1400, enlarged the building, but the addition necessary to accommodate the Court of the Emperor did not notably increase the Castle Palace of a Count Palatine. In 1415 it became the prison of the Pope John XXII. It was further enlarged by Count Louis III. some time before his decease in 1436. Louis V. between 1508 and 1533, made the important addition of the Great Round Tower, and the still more important one of the Great Terrace, which rises to a very great height on the precipitous side of the mountain. Frederick II. his brother, who succeeded him in 1544, built more than any of his predecessors, and completed the works still left imperfect. The walls which united the Square Tower with the Tower of Frederick the Victorious were raised and thickened in 1545, and following his brother's example, but with much more magnificence, both within and without the old palace, he continued the stone facings to the older parts. The Round Tower which Louis V. had erected near the Chapel of Jetta was improved by him, and several upper stories added. In 1554 a large bell was placed in the tower, after which it was called the Tower of the Bell until its ruin took place; it then continued to receive additions from its successive owners until the seventeenth century, after which it was several times devastated during the 30 year's war, 1618—1648, and nearly ruined in the war of Louis XIV. 1689—1697, but it was restored after each of those periods, and fell ultimately into its present state of ruin, not from the effects of war, but from one of those visitations of Providence over which man has no control. On the 23rd of June, 1760, it was struck by lightning, and for the most part destroyed, and since that time it has never been restored.

I now pass on to a more particular description of the ruins, beginning with the oldest part of the building. Next the court yard is a fine projecting oriel window, a feature more common in Continental Mediæval architecture than it is in England. There is a very fine example in the principal front of the Chateau at Blois, there are numerous examples in Germany, as at Prague, and in the later domestic architecture of Franckfort, Mayence and other towns, and it is not wanting in Ecclesiastical architecture, of which a very good specimen of the date of the sixteenth century occurs in the Church of Saint Mary at Cologne. This part of the building formerly contained three vaulted stories, now entirely reduced to ruins; the evident solidity of its original construction may be taken as sufficient evidence that more than ordinary violence must have been used in its destruction.

The building of Ruprecht, Elector Palatine and King of the Romans, was constructed by him in the year 1400; restored by the Elector Louis V. in 1540; embellished by his brother Frederick II., and devastated in the Orleans War of 1689. It is also in a very ruined condition, but has on the face next the court yard some fine fragments of carving, chiefly armorial bearings, which,

although much decayed, bear in parts the evidences of having been formerly gilt. Under one of them is an inscription to the effect that—

One thousand four hundred years were counted,
When Count Ruprecht was elected
King of the Romans. He reigned 10 Years,
And constructed this Building,
Which the Count Palatine Louis repaired
Such as it now is.
It was in the Year 1000. 500. and 44,
When he himself was taken away from this world.
May Christ Jesus give peace to the souls of both of them.

Some traces remain internally to show the different levels of the vaulted floors, and some of the sculptured corbels for the springing of the groined arches. There are also the remains of a fine sculptured chimney piece which ornamented a room formerly existing, and bears the date 15(CF)46. This chimney piece presents a decoration remarkable on account for its unsuitableness to a room used for festive meetings, as it represents, in an allegorical form, the inevitable end of this life and the commencement of the next—an allusion to a solemn truth according but little with the ordinary uses of a festive hall.

Next follow buildings used as dependencies to the principal buildings, and built by the Elector Palatine, Louis V, in 1520. They remained uninhabited after the Court of the Elector removed to Manheim, and so continued until almost totally destroyed by the conflagration of 1764. Part has since been occupied by the people employed about the ruins. There is no architectural feature of any value to distinguish them externally, and internally it is difficult to make out amongst the mass of ruins the destination of the various rooms, except the kitchen, by its chimney and the ovens.

The portion called the Building of Louis, was built by the Elector Louis V. in 1521; injured by fire in the Orleans war of 1689; repaired by the Elector Charles Phillip after 1716; and destroyed by lightning in 1764.

The part called the Palais of Otho Henry, containing the Ritter-saal or Knights' Hall, is the richest portion of the castle. It was began by Frederick II. in 1549, and terminated in 1559 by Otho Henry. During the thirty years' war, this building suffered much, and also from a fire in 1634. It was restored by the Elector Charles Louis in 1659; further injured in the Orleans war, 1689-1693, but afterwards restored. Either the injuries sustained on the side of the court yard must have been very trivial—as was probably the case—or the restoration was executed with uncommon ability. It was finally destroyed in 1764, together with the other portions of the building, by the catastrophe already mentioned.

The west façade, that next the court, is a very remarkable work, and I know of no piece of Palatial architecture which surpasses it, or even equals it in richness of decoration, notwithstanding the ruin to which it has been exposed. So much as remains is still in a very fine state. The masonry is well and solidly executed, and the stone remarkably perfect, the delicately sculptured decorations being even now in a good state of preservation.

It would be tedious to enter on any lengthy account of the several portions of this façade. An inspection of the photographs and the engravings will best explain its leading features. The general proportions are very satisfactory, as well as the grouping of the windows and the horizontal divisions of the string courses and cornices; it is placed on an elevated basement, and the whole is on a scale sufficiently large to make it a noble and imposing front.

The details of the pilasters, cornices, and dressings to the windows, shew a wide departure from classic proportions, and are not happy, but there is an exuberant richness of decoration conceived and executed in the very best manner, which more than redeems these defects, and is worthy to rank with the best work of the same time in Italy. As a very near approximation in Italian work, I may refer to a chimney piece forming part of the Soulages' Collection now in this country, of about the same date. I do not, however, claim for it all the grace and delicacy of some of the highest class work of that country, but it is very masterly, not only in the arabesque, but in the supporters and other figure decorations of the armorial bearings, both animal and human, nude and draped. The central doorway, once approached by a fine flight of steps, with caryatides supporting well-proportioned entablatures, and remarkably rich, effective, and skilfully treated armorial bearings above the door, is a very remarkable and artistic work.

The tower of the Library, or the Apothecary's Tower, was constructed in the years 1550—1554, by Frederick II.; injured by fire in the second assault on the castle during the Orleans war in 1693; restored by Charles Philip after 1713; and finally ruined by lightning in 1764.

This tower was not entirely circular, but it was square next the buildings last described. It was built of great strength, as it formed an important part of the defence of the castle. The number of windows, nine on each story, is, however, very considerable; the motive, no doubt, was to obtain the necessary light for the valuable library which it was destined to contain, which, however, it did not long retain, as the succeeding Electors gave it to the neighbouring University of Heidelberg. Nor was it allowed to remain there, for it was taken in 1622, in the thirty years' war, by General Tilly, who commanded the Imperialist and Bavarian forces, and given by Maximilian, Duke of Bavaria, to the Pope, who transported it to Rome, where it still remains in the Vatican, arranged in several rooms, under the name of the Bibliotheca Palatina. Forty-two of its manuscripts were esteemed of sufficient value to be carried by Buonaparte to Paris, but on the general restitution in 1815, the University of Heidelberg claimed and obtained them, and, encouraged by their success, they applied to the Pope for the remaining part of their ancient treasure; the appeal was so far responded to, that they obtained the German manuscripts, making, with those recovered from Paris, more than 1000 manuscripts.

The original collection is said to have contained several thousand valuable Greek manuscripts, but they were much injured and many destroyed in the siege by Tilly, by whom they were used as litter for his cavalry horses.

This fine and costly collection of books recals that made, nearly at the same time, for the Chateau of Fontainebleau by its liberal founder Francis I.

The new buildings of Frederick II. were built on the foundations of a much earlier building, and intended at first for the library; they were burnt in the war of 1689, restored by Charles Philip in 1716, and destroyed in 1764, but since then they have been in great part refitted, and are now used partly as a habitation and partly as a museum, containing some relics connected with the castle and its founders. That part of the building which has not been restored is altogether in a state of ruin; the exterior fronts are plain, like all the rest of the building, but there is one fine projecting bay window on the east, which gives much character to this part of the building. The interior façade is, I consider, remarkably elegant; it contains an open arcade, the lower part composed of two very elegant arches formed of portions of parabolas, with a double story of arcades above of four arches on each story; the spandrils between the lower arches are decorated with very finely carved emblazoned shields surrounded with wreaths of foliage. The centre shield is dated 1549, and on the riband which surrounds

it are the letters D. C. V. said to be the initials of the sculptor; on the left hand side are the armorial bearings and initials of the Count Palatine Frederick; and on the other the arms and initials of the Electress, Dorothea, Princess of Denmark. Above this there formerly existed another arcade, no trace of which remains.

The use of the lofty narrow gabled slip which completes this part of the building on the left is not exactly known; it is very strongly built, every floor was vaulted, all the windows barred, and its projection from the other parts of the building must have allowed of its being observed on all sides; it has been conjectured that it may have been used as a treasure house. The upper part of the gable is richly decorated with ornament, giving a more graceful outline than the ordinary step gable; and below is a sun dial, which was a very common decoration all over Europe from the sixteenth to the eighteenth century.

Of the old arsenal nothing but the lower part of the walls remains; it was built in 1455, devastated in the Orleans wars in 1689—1693, and destroyed in 1764; since then it has gradually lost all form of a building.

The Clock or Bell Tower—or octagon Tower, was built in 1525, by the Elector Louis V.; it was raised by his brother and successor, Frederick II. in 1545-1547, in order to receive a bell; and was restored or repaired by Frederick IV. in 1608. It suffered severely in the thirty years' war, and particularly in the years 1632, 33, and 34; it was repaired and embellished by the Elector Charles Louis in 1655, again greatly injured in the Orleans wars from 1689 to 1693, and was the first portion of the building destroyed by lightning in 1764. This tower forms the most picturesque object in the views of the castle: it still retains five out of six of its original stories, and the turret staircase communicating between the several floors, is still tolerably perfect; when complete with its additional story, high-pointed roof, and mullioned window, it must have been a very fine monument.

The Palace of Frederick IV., or Chapel of St. Ulrick, was built by Frederick IV. in 1601-1607. It was damaged in the Orleans war of 1689, repaired by Charles Phillip in 1716, and finally much injured by the fire of 1764; but the chapel was roofed and partially restored, and did not totally cease to be used until the early part of this century—1803. This building, though forty or fifty years later than that of Otho Henry, is much in the same style, and contains the same number of stories, and general arrangement of parts. It is not generally so much admired as the more decorated eastern building; as it is not nearly so elaborate in its decoration, which is certainly not so chaste; but there is greater dignity in its composition, and more perfect proportion in its parts; and the north front, which is less decorated than the south front towards the court, and where the statues are wholly omitted, is as fine, or indeed a finer composition than anything of the same date with which I am acquainted, the lower part especially. The basement or podium, and the grand floor on both fronts, are full of force and fine character.

The Tun Room, part of the palace of Frederick V., was commenced by Frederick IV. between the years 1601 and 1608, finished by his son and successor, Frederick V. from 1610 to 1619, and burnt in the Orleans war, in 1689. Of the celebrated Tun it is not necessary here to speak; its wooden framework is handsomely constructed, but its dimensions are, I believe, much surpassed by some of the wooden vats used in the London breweries.

The Gallery of the Chateau was originally built in 1346, and remodelled in 1601-1607, when the palace of Frederick IV. was built, but the balustrade and corner turrets are of later date. This terrace, which is the first part of the building reached in ascending from the town by the footway, already mentioned, is in itself a very noble work, the imposing north front of the

castle bounds it on one side, and on the other there is a most charming view, extending over the valley of the Neckar, and the town of Heidelberg almost immediately below.

The Building of Charles Louis, was constructed by that Prince in the second half of the seventeenth century on the ruins of the old chapel of the castle, and destroyed in the Orleans war in 1689—so that nothing now remains but some portions of the ancient building which served as its substructure.

The ancient well of the fortress is covered by a portico, the columns of which were taken by order of the Elector Louis V. from the ruins of the palace of Charlemagne at Nieder Ingelheim. They are the remains of a hundred similar columns of granite, brought out of Italy by Charlemagne. The capitals and bases were added in the time of Louis V. in 1355.

The Tower of the Great Gate, or Tower of the Giant was finished by the last named Prince in 1355. The sculptures on the outer face of this tower are considerably later, being of the date of 1541, and were evidently designed with reference to the feudal tower to which they are attached, for although of the same date as the best Renaissance work about the castle, the style is totally different. The lions formerly supported shields of metal let into the wall; it is said they were of silver, but no traces are now left, except the recesses which they occupied. The approach to this gateway is over a narrow bridge across the deep and beautiful ravine which surrounds the castle.

The Riven Tower was once called the Tower of Frederick the Victorious, by whom it was built 1450-1460. It was restored or repaired by the Elector Frederick IV., and destroyed by the explosion of a mine in the Orleans war in 1689. The walls are twenty feet thick, and it contained three stories of batteries, some of the rings used for working the cannon being still visible. The fallen portion of the tower, which has slipped in one huge mass into the fosse below, and is now partly concealed amongst the stems and foliage of the trees, is strikingly picturesque.

The Elizabeth Gate gives access to the terrace, built by Frederick V., and dedicated, according to the inscription, to his beloved wife Elizabeth, in the year 1615. The arch has twisted columns in the shape of trunks of trees, covered with creeping foliage, with richly foliated capitals, and an ingenious display of lizards and serpents on the shafts; but the whole composition is meagre and in bad taste, notwithstanding the ingenuity of the sculpture with which it is lavishly decorated.

The great Rampart of the castle, a truly colossal work, raised from the ground below on four or five stories of vaults, was formerly used as an outer battery, but in more modern times as a magnificent esplanade.

The Great Tower was built by Louis V., in 1533, and ruined by the French in the Orleans war, on the 16th February, 1689. This was even more massive in its construction than the tower of Frederick I., and is said to have been when complete one of the highest in Europe.

I feel it right to observe that I have availed myself of the description published by Monsieur de Graimberg for all the details I have been enabled to offer, and that the prints on the walls form part of a work published by him. This gentleman, many years ago, seeing how totally the building was neglected, constituted himself the guardian of the place; he has collected a very respectable museum; and his unwearied attention has done much to arrest the further progress of decay.

In this building there is certainly much to remind us of the style commonly called Elizabethan, which prevailed in this country from the time when Longleat was built, until that in which the works of Inigo Jones, and especially his façade of the banquetting house at Whitehall, in 1619, opened the way to a new era in architecture. There is not an unfrequent application of the strap ornament and the flat jointed band, which are applied as decorations to the pilasters, particularly in late buildings of the beginning of the seventeenth century. There is also the same somewhat

exaggerated entasis of the pilaster, but all the features are much more boldly marked than with us; the strap ornament, for example, is made to project in bold masses at its extremities, so as to produce great variety of light and shade—the flat-jointed bands are not so small or complicated, nor so much like panel-work, as in our specimens at Holland House or Dorton House, 1596.

The entasis of the pilaster assumes a remarkable boldness, and gives great vigour to the Doric order used in the lower story of the north front in the building of Frederick IV. The same feature I have observed in one of the buildings at Strasburg, but nowhere else so effectively carried out. The use of the reversed column or pilaster is comparatively rare in the German work, and then only in very subordinate features. The niche with the peculiar shell form of the head, which is also not uncommon in French buildings of same style, takes the place of the flat arched pannel with which chiefly the interior of our Elizabethan, is frequently decorated.

The departure from the previous national type in France is less decided in outline and general form than with us—for the French retained the lofty roofs of the late Gothic, and the Castle of Heidleberg has its stepped and decorated gables as all the old houses had from Vienna to Antwerp, while the English adopted a substitute for the Italian balustrade and level cornice, for which it must, however, be admitted that the flat roofs and embattled parapets of our later Gothic had prepared the way.

There is throughout these buildings no want of evidence of a very rude departure from the proportions and rules of classical architecture, or it might perhaps be more properly said that classical models were crudely and ill-applied. The façade of Otho Henry, next the Inner Court, although full of beautiful work, is especially full of such defects—the attenuated proportions of the Ionic pilaster—the disproportionate height of the window pediments, and the setting back of the molded head behind the horizontal cornice below, are all crudities which show but a very imperfect acquaintance with the Italian types of the age, or at least an imperfect power of applying them; but apart from these defects the general balance of parts is very happy, and the decoration generally in very good taste.

The ornament, indeed, of this period appear to me the most perfect which has ever been used for architectural purposes; being sufficiently conventional to be used as architectural decoration, and yet sufficiently approaching to natural forms to suggest the vigour and movement of life, the flow even of sap in the veins of the plants, and more developed life in the lizards and birds which fill up the blank spaces in the leafage.

The finest specimens of this kind of decoration are certainly to be found in Italian work, of which there are many beautiful specimens in the Renaissance Court of the Crystal Palace, the most perfect in my judgment, in matter of ornament, being in the two doors in the screen next the central nave; the case of one is copied from a doorway presented to the Doge Andrea Doria by the Senate of Genoa, and supposed to be the work of Pierino del Vaga, who was engaged with Raffaelle on the Loggie of the Vatican, which work he left in 1527.

The decoration which, however, I would more particularly mention, is that of a small ornament inserted next the pilaster of the door from the church of Santa Maria dei Miracoli at Venice: it is perfect of its kind and entirely free from the less happy compositions of the same time, in which, as in the decoration in the Vatican, satyrs, cupids, and monsters, supported on impossible bases, balance each other on opposite sides by a stiff central stem. In the frame of one of these doors is a fine frieze from the tomb of the Cardinal d'Amboise, at Rouen, of the date of 1520–26; it is not a work of the same delicacy as the Italian one just referred to, but it displays great beauty and masterly workmanship.

The works I have been referring to at Heidelberg are, as a whole, worthy to be classed with

any of the Renaissance school. They have well marked individuality of character, fine taste in ornamentation, and are unrivalled in the adoption of heraldic decorations. So far as I know, they are superior to any we have in England, fit to stand in equal rank with the best works of France, and not unworthy examples of the style which grew up in that great cradle of the arts in modern times—Italy.

Mr. Digby Wyatt, Hon. Sec., observed that, considering the early period at which German artists went to Italy to study, and carried the Tedesco style into that country, it was remarkable that after their return home, Germany should have been the last to adopt the features of the Renaissance style in architecture, and then even to a much less extent structurally than any other country in Europe. The principal artists in the Renaissance style in Germany were the family of Fischer, both Peter Fischer and his sons having studied in Italy; and it was through their examples at Nuremberg and in its neighbourhood, that the Renaissance style was introduced into Germany. These, however, were only examples of the details of the style. Mr. I'Anson had enumerated all the principal examples in Germany, and not in one of these were the revived antique orders carried out in their integrity. The town hall of Cologne was in a very vitiated style, the columns throughout resembling a row of very thin gentlemen placed close together. In Heidelberg Castle there was very little attempt at a regular Order. It was further somewhat curious that at the very time Peter Fischer was executing his best Renaissance work, some of his contemporaries and imitators continued to work in the Gothic style; and the wood engravings of the period shewed the disinclination of the Germans to adopt a pure Renaissance character. The arts of engraving on copper plates and armour, as well as of damascening, were transferred from Florence, Milan, Venice, Ferrara, and other cities of the North of Italy to Augsburg and Nuremberg. A picturesque style was subsequently adopted which had not inaptly been designated "the Rubens'"; for in it wood, stone, brick and plaster were alike made to assume that rotundity of form allied to a general heaviness of proportion frequently to be observed in the paintings of the great Sir Peter Paul. Under these circumstances it was peculiarly interesting to dwell upon one of the very few monuments of Germany presenting the characteristics of Renaissance art.

Mr. Scoles, Fellow, had rambled a few months ago over the castle of Heidelberg, but without the opportunity of studying it so carefully as Mr. I'Anson had. He quite concurred in the opinion that the Renaissance style was never acclimatized in Germany, the details being much inferior in delicacy to those of France. Heidelberg, however, must always be admired for the beauty of its situation, its palatial grandeur and its picturesque effects.

The Chairman, Mr. G. G. Scott, V.P., said, that he had not studied much the interesting question of the different ways in which the revival of classical architecture shewed itself in different countries. In Italy it appeared that the general form and outline of buildings had never departed much from the classical model. At a very early period, buildings assumed an absolutely classical form, but the details remained until long after of a Gothic character. North of the Alps the contrary was the case. There, the details were meant to be classical, whilst the general form was farther removed than ever from the classical type, as if the country was resisting with all its might the adoption of the new style. He differed somewhat from the opinion of Mr. Wyatt, that the Renaissance style had not been common in Germany. In the street architecture of that country, the style prevailed to an enormous extent. A profusion of gables and other forms, of every shape that imagination could devise, and as far from the classical outline as could be conceived, distinguished these German houses. The Town Hall of

Bremen was especially remarkable for its immense towering gables, and the intricate forms of the detail. Every imaginable fantasy of ornament was introduced, and there was not a foot of plain surface throughout. At Hamburgh and other towns the same features were found, proving, as he thought, that the style had pervaded the country to a great extent; and that, instead of being poor in Renaissance art, Germany was full of the most gorgeous specimens of it, although the detail was not equal to that of France and Italy.

Mr. Digby Wyatt said, that he ought to have made the distinction between the kind of art produced by the struggle with Gothic architecture for the admission of the Renaissance, and that of the period when the antique was imitated with exactitude. The majority of the buildings referred to by Mr. Scott were based as to their main structure upon ordinary Mediæval practice, and as to their details, which were of a debased cinque cento character, upon the precedents for the design of ornaments of every description, made popular by the class of prolific engravers known as the "Petits Maîtres," such as the Behams, the Hopffers, Theodor de Bry, Virgil Solis, Altdorfer, Aldegraever, and others. These were the class of men who multiplied patterns of application for the Renaissance forms to every branch of art and industry throughout Europe, during the end of the sixteenth century, and the whole of the seventeenth. He believed, therefore, he was correct in saying that there was exceedingly little pure Renaissance architecture in Germany. The gables and other features referred to by Mr. Scott, belonged to what he (Mr. Wyatt) had termed the Rubens' style, the houses themselves being mostly of lath and plaster, and the designs founded upon the school of facile drawing which arose from the engravings already mentioned.

A vote of thanks to Mr. I'Anson having been carried, the Meeting adjourned.

A DISCUSSION ON THE VARIOUS METHODS OF INDURATING AND PRESERVING STONE-WORK,

At the Ordinary General Meeting of the Royal Institute of British Architects, January 26th, 1857.

Mr. Henry M. Witt, F.C.S., Visitor,* read the following remarks:—The decay and preservation of stone being in a great measure a chemical question, it is very necessary that an architect should be acquainted both with the first principles of the chemical action of the air in the disintegration of the different stones, and with those which should guide him in forming a just opinion on the various processes suggested for their preservation; so that he may neither be led away by the specious statements of interested parties, nor induced to pass a hasty condemnation on all alike, without either understanding their mode of action, or testing them by experiments of a decisive and satisfactory character.

The destructive action of the atmosphere upon the various kinds of building stones, may be classified under two heads. In all cases it is the solvent action of water and carbonic acid which effects the decay. These agents affect stones in different ways, according to their composition, which, however, may generally be referred to one of two classes, viz., the earthy carbonates, and the earthy and alkaline silicates.

Under the first named may be included the larger number of common building stones, the limestones and dolomites of the "oolitic" and "magnesian limestone formations," which are chiefly carbonates of lime and magnesia, and also the sandstones, for in these the sand is agglutinated by carbonate of lime.

These neutral carbonates of lime and magnesia are insoluble in *pure* water, and would remain entirely unacted upon if the atmosphere consisted only of pure nitrogen, oxygen, and aqueous vapour; but it always contains carbonic acid, which being soluble in water is carried down by the rain, and these earthy carbonates are dissolved in an aqueous solution of this acid; moreover, whenever rain falls upon a surface of carbonate of lime (Ca O, CO_2) a portion of it is dissolved in the form of acid, or bicarbonate of lime (Ca O, CO_2; HO, CO_2), hence the presence of considerable quantities of carbonate of lime in spring and river waters passing through chalky and limestone districts. If, however, the temperature of such solutions be raised, or if they be long exposed to the air, the carbonic acid is evaporated and the carbonate of lime precipitated; it is thus that incrustations of natural objects met with in the neighbourhood of these springs are formed. A curious illustration of this fact I have also observed when examining the action of the weather on the south-western side of the Church of St. Luke, Chelsea; wherever there is a sloping ledge the rain, in running down, has dissolved a certain quantity of carbonate of lime in the form of bicarbonate, but on arriving at the edge it has collected in drops, or been drawn under it by capillary attraction, and being prevented by the same force from falling to the ground, it has remained a sufficient time exposed to the air for the carbonic acid to evaporate, and the carbonate of lime to be deposited in droplets or miniature stalactites: this is doubtless a common phenomenon, which has been frequently observed, but it is an interesting proof of the accuracy of our views respecting the action of rain water upon such stones, for there we have the very same carbonate of lime which has been dissolved out of the edifice in one place, deposited in another.

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* Asst. Chemist, Government School of Mines.

The granites, porphyries, clay slates, and such minerals, are acted upon by the atmosphere in a different way; the general nature of the process may, however, be well illustrated in the case of granite, a rock which being often very hard is popularly deemed indestructible; but that such is far from being the case is obvious in the weather-worn crumbling surfaces of the masses of granitic rock on our own coasts, as in Cornwall. The action of water and carbonic acid on granite is different in nature and *slower*, but as certainly destructive ultimately as in the case of the limestones.

The composition of granite, or at least of felspar its largest constituent, may be thus represented (KO, SO_3; $Al_2 O_3, {}_3SO_3$), that is to say, a double silicate of potash, and alumina; and when carbonic acid, dissolved in water, is brought repeatedly in contact with it, the potash is dissolved out from the silicate of potash in the form of carbonate of potash, leaving the silica in a flocculent partially soluble state; the silicate of alumina, though unacted upon, is left in a disintegrated state; so that by the mere agency of air and rain water the massive rock crumbles to powder.

The foregoing remarks apply to the action of the pure air of the open country upon stones. These are destructive influences to which all buildings, even in the purest and most serene atmosphere, are constantly exposed, and from which no stone, however good and well selected, can be free. But in large towns, where enormous quantities of coal are burnt, stone is subjected to far more adverse influences; the particles of carbonaceous matter (soot) constantly floating about in such an atmosphere, are carried down by the rain, deposited on the stone, and there cemented by the carbonate of lime which is simultaneously precipitated, in consequence of evaporation from the rain water in which it had been dissolved off other parts of the building in the form of bicarbonate. Thus the buildings become covered with a funereal encrustation, producing that sombre appearance which occasions such a striking contrast between the public buildings of our metropolis and those of Paris and other continental towns where wood is the common fuel. This coating, though marring the beauty of the architecture, conduces to a certain extent to the preservation of the stone by forming a layer impervious to water, and thus preserves the subjacent carbonate of lime from further contact with the acid solution. Sometimes, however, moisture penetrates through cracks in the surface layer and permeates behind it, then dry or frosty weather setting in the coating becomes loosened and whole masses fall off at a time; the result is necessarily very destructive, but it is one which may be frequently observed. Moreover the atmosphere of these coal-consuming districts contains, besides carbonic acid, also sulphurous and sulphuric acids, which act upon carbonate of lime much more energetically and in a more injurious manner than the carbonic acid.

Some stones being more readily acted upon by these agencies than others, on account of peculiarities in their physical structure, with which the architect can only become familiar by practice, it is obvious that the utmost caution should be exercised in the choice of stone for public buildings; nevertheless, since even the best selected stones are liable to and must ultimately yield to the same destructive agencies, the difference being only one of degree, it is but natural that attention should have long since been drawn to methods for preventing the mischief; many of which, to judge on chemical principles, merit the serious attention of the architect, and the most unprejudiced trials.

They may be divided into two essentially distinct classes. In the one the object is to cover the stone with a layer of some material, organic or inorganic, vegetable or mineral, having no chemical action on the stone itself, but serving only to cover it with a surface, which not being affected by, or having a repulsive action towards water, shall preserve the subjacent stone from the contact of the acid solution, just as wood is preserved by a coating of paint. Although these methods vary much in detail, they have all the same object and are all more or less useful, though less valuable than the second class of processes to be hereafter alluded to.

The most obvious method is to cover the building with a coating of paint, as in the case of the new façade of Buckingham Palace. This is obviously better than allowing the stone to decay, but it is a very temporary expedient, and liable to the objection that, if the paint be made of lead, it speedily becomes black from the sulphuretted hydrogen of the atmosphere of an English town.

Many patents have been taken out, to which Mr. Smith alluded at length in his paper, read here on the 1st ult., which consist in soaking the stone in, or covering its surface with, a layer of an oily body of some kind: motives of cheapness and convenience may, to a certain extent, influence the selection. These are all valuable for a certain length of time. So long as the oily coating does not itself decay, it must afford important protection to the stone beneath; and no doubt there are many here present who can testify to the practical value of one or other of the processes of this class which have been suggested. But it must not be forgotten that all vegetable bodies—indeed, organic compounds generally—are subject to a process of decay, quite different in character from those to which I have before alluded. All these bodies, which consist essentially of carbon and hydrogen, are combustible, and, when burnt, are converted into carbonic acid and water (the compounds of these two elements with oxygen—viz., CO_2, and HO), and, by long exposure to the air, the very same result ensues, only more slowly; so that in process of time they entirely disappear, being converted into invisible gases, and no trace of them remaining. Their action can therefore be but temporary, their durability being, in fact, considerably less than that of the stone—as much so, perhaps, as wood is less lasting than stone. They can obviously only be of value whilst they last, and their existence is but ephemeral.

Besides, in selecting the oils, it should be remembered that there are two classes—one distinguished as *drying*, the other as *non-drying;* and it is the former which are of the greatest value. These drying-oils (oil of turpentine and linseed-oil are common examples), on exposure to the air, absorb oxygen, and are converted into resins, which are more durable, and form a more impervious coating than the oils themselves.

And here I would draw attention to a remark made by Mr. Smith respecting the similarity in ultimate composition of the fats, fixed and volatile oils, alcohol, and ether. He classed these bodies in one table, showing their percentage of carbon, hydrogen, and oxygen, and drew the inference that, in consequence of their similarity in ultimate composition, and their common vegetable origin, they differed but little in their nature and constitution from each other. It is true that they may "possess a mutual good feeling for each other's company," and that Mr. Smith, by the aid of his "cauldron," might succeed in making a "hotch-potch" of them; but this does not prove any close similarity in their nature or real composition. The only respect in which they have any resemblance is in their having a vegetable origin, and containing carbon, hydrogen, and oxygen. But I would remind him that there exist many thousands of organic compounds of vegetable origin, which manifest the most opposite chemical properties—some being acids, some alkalies, some neutral bodies, some soluble in water, and some insoluble; some sweet, some sour, some bitter; some having the most delightful of perfumes, and some the vilest of odours—and yet they all contain but carbon, hydrogen, and oxygen.

Again: it does not follow that, because two bodies consist of carbon, hydrogen, and oxygen, *even in the same proportion*, they are identical, or even closely resemble each other; for it not unfrequently happens that bodies which, when submitted to ultimate analysis, are found to contain carbon, hydrogen, and oxygen, in exactly the same percentage proportion, are nevertheless strikingly different bodies, possessing the most discordant properties—probably from the elements being arranged in a different way—containing, in fact, the same ultimate elements, but different proximate constituents.

For example: common alcohol and the ether of wood spirit have exactly the same percentage composition, viz. :—

Carbon	52·17
Hydrogen	13·03
Oxygen	34·80
	100·00

Nevertheless their properties are very different, the one being an alcohol, and the other an ether—the latter being an inflammable gas at temperatures at which the other remains perfectly liquid.

Again: no one would confound the unpleasantly strong-smelling oil of turpentine with the essence of lemons, or otto of roses; yet they all three have the same per centage composition. Or, to take an illustration from among the organic salts (or ethers), some, though having the same ultimate composition, yet contain different acids and bases—*e.g.*, $C_6 H_6 O_4$ is the simplest representation of two bodies which widely differ from one another—viz., the formiate of oxide of ethyle $C_4 H_5 O + C_2 HO_3$; and the acetate of oxide of methyle $C_2 H_3 O + C_4 H_3 O_3$.

Hundreds of examples might be adduced, but, to apply these generalizations to the particular case, we have in Mr. Smith's table bodies of the most various nature, constitution and properties, classed together, and said to resemble each other most intimately;—there are ether and alcohol, which are types of two distinct classes of bodies in organic chemistry, and which, if alone applied to a stone, would in a few days evaporate, and leave not a trace behind: they are only useful for dissolving resins and some oils. Then we have resins—a class of bodies soluble in alcohol, ether, and some oils (as turpentine), and which dry to a hard crust. Then volatile oils, which oxidise to resins, and are soluble in alcohol. Then fixed oils and fats, which do not dry to resins, and are insoluble in alcohol. And lastly, caoutchouc, pitch, tar, &c., which are themselves the most complicated mixtures of oils, volatile and fixed, with resins, gum, &c., moreover varying in composition and properties to the most extraordinary extent.

So that the compounders of mixtures for preserving stone must not imagine that, because these bodies so closely resemble one another in their ultimate elementary composition, they are necessarily identical, or even very similar in real nature and properties.

I might also explain the reason of the numbers in the table all amounting to 100, which is so enigmatical to Mr. Smith; but it would lead too far into chemical details.

To return to the subject under discussion, viz. the processes for the preservation of stone.

It has been already mentioned that all the methods which consist in coating the stone with organic mixtures, composed of oils, resins, fats, &c. though more or less valuable, are but temporary expedients compared with others to be subsequently mentioned.

Under this first class may be included those of "The Indurated Stone Company" (François Teychenne), and of "The London Stone Hardening and Preserving Company" (Mr. Barrett); Mr. Henry Clinton Page's Patent; and lastly, Mr. John Benjamin Daines'.

Having recently seen the trials of Mr. Daines' process at the Houses of Parliament, I may be allowed to make a few remarks specially in reference to it. It differs in no essential respect from the others of the same class, consisting essentially in coating the stone with linseed-oil, to enable it to resist the action of moisture. The only variation from the others is in treating the stone with a solution of sulphate of zinc or of alum, previously to applying the oil, and also in dissolving in the oil sulphur or liver of sulphur. I am at a loss to understand what advantage is sought by this modification, and in what the superiority of this over any of the other processes for coating the stone with a

layer of oily or resinous matter consists, or, indeed, why it is preferable to paint, especially if zinc, instead of lead, colours be used. But it certainly has many serious disadvantages; for in the first place, the action of the sulphur, whether in the free state or as liver of sulphur, upon either the impurities in the sulphate of zinc applied, or on the iron in the stone, produces a black sulphide, which gradually darkens the colour of the stone, and will doubtless soon render it almost black; a result certainly anything but desirable in London, where the atmosphere generally performs this office but too rapidly. Secondly, it is rather a dangerous experiment to introduce into the stone an element like sulphur, which, by oxidation, is gradually converted into sulphurous and sulphuric acids,—the very acids which, as products of the combustion of coal, render the atmosphere of London and other large towns so much more injurious to stone than that of the open country: it is, in fact, sowing within the stone the prolific seeds of its destruction.

The second class into which I have divided the various processes, embraces those the object of which is, either to convert the surface of the stone itself into a chemical compound less readily affected by an aqueous solution of carbonic acid (rain-water), than the original stone, or to deposit a less destructible chemical compound in or upon it.

The first suggestion of this kind, and, I believe, after all the most valuable, is that made by Professor Fuchs, of Munich, for the preservation of frescoe paintings, and successfully applied by Kaulbach (of which an example exists in the Museum of Practical Geology). It was subsequently employed for the preservation of ordinary stone erections by M. Kuhlmann, of Paris.* It consists in washing the stone surface after erection with a solution of silicate of soda (NaO, SO_3); but, in order that the process may be successful, its mode of action should be understood, and all the necessary precautions should be adopted in carrying it out. When the solution of silicate of soda (NaO, SiO_3) is applied to a limestone (CaO, CO_2), a double decomposition takes place, silicate of lime (CaO, SiO_3) and carbonate of soda (NaO, CO_2) are formed: that this is really its mode of action, I have satisfied myself by experiments made on pieces of stone treated in this manner by my friend, Mr. Henry Burnell. The establishment of this fact is one of considerable importance, as affecting the theory of its action, as it proves that we convert the carbonate of lime, which is so readily acted upon by an aqueous solution of carbonic acid, into one of the most insoluble of mineral bodies—the silicate of lime—one, moreover, which is scarcely, if at all, affected by carbonic acid, and this without in the least degree injuring the structure of the surface.

It is true that at the same time another action goes on, carbonic acid is capable of decomposing silicate of soda, as I mentioned when speaking of the disintegration of granite, and by this means free silica is likewise deposited on the surface, and in the pores of the stones; this silica, thus deposited, is more or less insoluble, but by prolonged exposure its solubility increases; still it is never all absolutely insoluble, and it appears to me that the great value of the silicate of soda arises from the formation of the silicate of lime from the very lime of which the stone itself is composed.

But as I said, certain precautions must be carefully attended to in its application; the secondary product, the carbonate of soda, which separates in the form of a saline efflorescence, must be carefully removed by washing from time to time, if sufficient rain does not fall to effect this result; moreover, it must not be imagined that one coating is sufficient—it should be repeated two or three times at intervals of several months, and the washings performed frequently during the intermediate periods; for this conversion of the carbonate of lime into silicate, and the removal of the soluble carbonate of

* See "Memoire sur l'Application des Silicates Alcalines Solubles au durecissement des Pierres Calcaires Poreuses." Paris. 1855.

potash takes place but gradually, and unless it be at first effectnally performed it is useless; but if it be thus carefully carried out, judging on general principles, as well as from experiments, which I have carefully watched, carried out by Mr. Henry Burnell, at Chelsea, I cannot but feel convinced that the process is likely to prove most valuable. I cannot, however, too strongly recommend that experimental trials should be made with the necessary care by persons who are both unprejudiced, and, from their understanding the principles of its mode of action, competent to decide upon its merits.

I would merely ask Mr. Smith whether the single experiment to which he alluded in his paper, of which the results were exhibited to the meeting, (to which experiment reference was made almost in the same words by the Rev. Mr. Barlow nearly two years ago,) whether it was performed with all that care, and whether all those precautions were adopted, which are necessary to enable him to come to a fair decision on the merits of the process? I could point out to him spots on the Church of St. Luke, Chelsea, which have under treatment with the silicate become so hard that one can scarcely scratch them with a walking-stick, whilst the stone close by the side of it crumbles to powder under the pressure of the thumb-nail.

There are two other processes to which I must briefly allude, viz., Mr. Ransome's and Mr. Smith's own novel suggestion.

Mr. Ransome's process consists in treating the surface of the stone first with a solution of silicate of potash or soda, and then with a solution of chloride of barium or chloride of calcium, by which means an insoluble silicate of baryta or lime is deposited in the pores of the stone. This process if judiciously carried out is undoubtedly likely to prove valuable, but *a priori* reasoning would certainly lead us to give the preference to the use of the silicate of potash alone, and subsequent washing with water, for the following reasons:—

If the action of the silicate consisted merely in the deposition of silica in the pores of the stone, as imagined by some, then undoubtedly Mr. Ransome's method would be not merely similar in mode of action to, but perhaps superior to, the use of the simple silicate; but I have before shown that the silicate converts the very substance of the stone itself into a hard insoluble mineral compound, the silicate of lime, and it is on this account that I am inclined to anticipate more favourable results from it than from Mr. Ransome's.

Moreover, the silicates of baryta and lime, which are deposited by Mr. Ransome's method in the stone, will, I fear, be in a finely-divided pulverulent state, and in that condition afford but slight protection to the subjacent carbonate; unless it be that the gelatinous silica deposited simultaneously from the silicate of soda by the action of the air serves as a binding material, uniting the whole into a compact surface; experience alone can decide this point, and I would strongly recommend Mr. Ransome's process, as second to none but the simple silicatisation, to the impartial judgment of those who are willing to give these two processes those careful experimental trials which their intrinsic merits so well deserve.

Mr. Smith's own suggestion, notwithstanding its ingenuity, is, I fear, not likely to afford very satisfactory results. He proposes to imitate those natural processes by which carbonate of lime is deposited in a compact form, as in stalactites, tufas, and other native encrustations; but how is this to be carried out on a building? In nature, the surface which becomes coated with carbonate of lime, remains for months or years constantly exposed to the action of water saturated with bicarbonate of lime, and the very compactness of the mass arises from the extreme slowness of its formation. But how are we to imitate artificially such a process with success? Could we submit the wall of a building to the action of a constant but uniform current of a saturated solution of bicarbonate lime for years? In the first place, what would be the expense of transporting a calcareous spring, or of forming one

artificially? and then, by what mechanical appliances could it be made to flow for years together over the surface to be coated? In fact, to produce a covering of compact massive carbonate of lime is impracticable, and if it be deposited quickly, it would be no better than the well-known process of white-washing. Indeed, even if it were possible to veneer a stone with compact carbonate of lime, it would be only equivalent to the choice originally of a good compact stone; for it would be still liable to the same destructive action of water and carbonic acid, as all other varieties of carbonate of lime, though somewhat more slowly; whilst the effect of the silicate of soda is to convert the stone superficially into silicate of lime, a mineral almost entirely unaffected by these agencies.

In conclusion, allow me to observe, that while it is the duty of the architect to select the best possible stone, it must not be forgotten, that even the best will always be liable to the same process of decay, the difference being rather one of degree than of kind, and therefore, if processes are from time to time suggested for protecting stone from this decay, it would appear both the duty and the interest of the architect to give them a fair trial.

Moreover, it can hardly be true that the *necessity* for preserving our buildings from premature decay is entirely an evil of modern date, for carbonate of lime must always have possessed the properties which it now has, and have been subject to the same kind of decay; but the fact is, that it is only in modern times that the attention of scientific, as well as practical men, has been directed to the discovery of processes for preventing that decay to which all building materials have been liable from the earliest epochs, and will continue subject, to the end of time.

The Hon. Secretary read portions of a communication from Mr. William Hutchison, of the Indurated Stone Works, Tunbridge Wells.

I continue to indurate the soft sand-stone of Tunbridge Wells for all engineering and building purposes. The stone is worked in its soft state to the desired form, however plain or elaborate, then dessicated prior to its induration; and this latter easy and simple process in a few hours renders it quite impervious to destructive weathering influence, also exceedingly hard and compact, susceptible of a brilliant transparent polish, and of every desired colour. It is also susceptible of silver and gold electroplating, or of any other metal, giving it the rich appearance of solid metal. Blocks of the largest dimensions, and any quantity, can be worked, dessicated, and indurated, as fast as required, either at the Indurating Works, or at the building in progress of construction.

My processes effect the same results on Portland, Anston, Bath, Caen, and other stones, or on any other absorbent material; but why indurate them, when soft sand-stone is preferable for cheapness, in sawing, working, drying, and indurating, and is, in fact, rendered indestructible from weathering influence, for all building purposes? Indurated sand-stone can be supplied at one-third less than the cost of Portland stone, &c.

Our expensive public statues in bronze, when first erected, are as bright as new coin, but in a few weeks, become black, dingy, and almost unrecognisable; whereas, if executed in soft stone, and then indurated by my processes, they would resist the destructive atmospheric influence, and become of a permanent milk white colour.

As to the application of any patent liquid to buildings already erected, I can practically prove it to be utterly ineffectual; but houses constructed of indurated stone exclude fœtid damp, vermin, and all possibility of malaria being retained in the walls.

Indurated sand-stone resists the pressure of the hydraulic machine, 540 tons having no effect on the cubic foot. Buildings constructed of it do not require battening, lath and plastering, as the

stone walls are internally even, ready for colouring, papering, and painting; and as fast as each compartment is constructed it may be occupied.

All stone used for building readily yields to the action of fire, either by calcination or otherwise; but soft stone, if indurated with inflammable materials, resists better than any other, from its pores being filled up; and where there is no air, there can be no combustion.

I have been several times honoured as the inventor of this process, whilst I am only the humble improver. The inventor was Mr. Le Goux, through accidently dropping some gas-tar on Caen stone, which gave rise to his studying the means of indurating it.

A Communication was read from Mr. Frederick Ransome.

Having been led to consider the importance of preserving the stonework of our public and private edifices from the decay resulting from the variable condition of our climate and other causes, I directed my attention to the existing processes proposed for effecting such an object; and more especially to that which has been for some time in use on the continent, in which a soluble silicate is employed; and I found that this process, though having for its base so important and indestructible a mineral as silica, was nevertheless very imperfect in its results.

It appeared to me that one great cause of failure arose from the fact that the silicate, being applied in a soluble form, was liable to be removed from the surface by rain, or even the humidity of the atmosphere, before the alkali in the silicate could absorb sufficient carbonic acid to precipitate the silica in an insoluble form.

But another great and serious defect in this process still existed—viz., that even were it possible to effect the precipitation of the silica, still it would be simply in the form of an impalpable powder possessing no cohesive properties in itself, and therefore able to afford but little, if any, real protection to the stone. It seemed to me, therefore, necessary not only to adopt a process which should insure an insoluble precipitate being produced, independently of the partial and uncertain action of the atmosphere, but that, to render such a means efficient, a much more tenacious substance than merely precipitated silica must be introduced; and in the course of my experiments I discovered that, by the application of a second solution, composed of chloride of calcium, a silicate of lime would be produced, possessing the strongest cohesive properties, and perfectly indestructible by atmospheric influences.

The mode of operation is simply this: the stone, or other material of which a building may be composed, should be first cleaned by the removal of any extraneous matter on the surface, and then brushed over with a solution of silicate of soda or potash (the specific gravity of which may be raised to suit the nature of the stone or other material); this should be followed by a solution of chloride of calcium, applied also with a brush; the lime immediately combines with the silica, forming silicate of lime in the pores of the stone; whilst the chlorine combines with the soda, forming chloride of sodium or common salt, which is removed at once by an excess of water.

From the foregoing description it will be apparent that this invention has not only rendered the operation totally independent of any condition of the atmosphere in completing the process, but the work executed is unaffected by any weather, even the most excessive rains. Experience has shown that where once applied to the stone it is impossible to remove it, unless with the surface of the stone itself.

I do not confine myself solely to the solutions above referred to; in some cases I prefer to use, first a solution of sulphate of alumina, and then a solution of caustic baryta, when a precipitate of sulphate of baryta and alumina is formed; the main object being to obtain by two or more solutions (which upon being brought into contact mutually decompose each other and produce) an indestructible mineral precipitate in the structure and upon the surface of the stone.

The following extracts from a Communication by Mr. JOHN BENJAMIN DAINES were read:—

Mr. Smith, in his paper read here in December last, entirely forgets one grand cause of the decomposition of buildings in our large towns,—I refer to the gases formed in our sewers and manufactories, and dispersed into the surrounding atmosphere, and more especially that caused by the burning of coals in all our dwellings. In London there are somewhere about 340,000 houses, which daily burn coals, containing at least one per cent. of sulphur, which is consequently sent forth in the form of sulphurous acid gas, the peculiar property of which is to attack and destroy building materials composed of either carbonate of lime or magnesia.

If I am rightly informed, Mr. Smith's experience must prove to him of how little use it is to select stone (so far as durability is concerned) for the erection of our metropolitan buildings. Bridgewater House, completed less than ten years ago, is now in a worse state of decay than any edifice in London erected for a similar period, and yet Mr. Smith himself was appointed to see that none but the best stone was used, and doubtless he did select the best; but the atmosphere of London is now very different from what it was at the time of the erection of St. Paul's Cathedral and Greenwich Hospital.

With regard to these two buildings (notwithstanding Mr. Smith's implied opinion), I find that portions *are much decomposed;* and I noticed in one place, on the body of the latter, that nearly an inch in depth had been separated from the original face of the stone. The surfaces which have become covered with depositions of soot and dirt are protected to a great extent; but the parts that are kept clean by the prevailing winds are suffering considerable decomposition.

Whatever care may be bestowed on the selection of the material, all stone buildings, in large towns especially, will be liable to premature decay; and in many instances, where they are erected of good stone, and rapidly decay, I believe we may look for causes belonging to the locality. In making these remarks, I of course exclude the granites.

Of late years many plans have been proposed for the preservation of stone; but, from not fulfilling the conditions necessary for the purpose, they have failed; indeed, had the change desired to be produced by some been effected, the result would have been the entire destruction of the stone to which the inventions were applied.

Warned by these failures, and taught by my own experiments during a number of years, I was led to look in another direction for the means of attaining the object. Having observed that linseed oil has the property of becoming exceedingly hard, from the absorption of oxygen, when applied alone, as on furniture, or when mixed with oxide of lead, as in paint, I was led to infer that, if I could discover some substance that would dissolve in linseed oil, be unalterable by the action of the atmosphere, and not interfere with the colour or composition of the stone, I should obtain the long sought for desideratum. This I have accomplished by dissolving sulphur in certain proportions, and at a certain temperature, in purified linseed oil.

My process consists in dissolving one part, by weight, of sublimed sulphur in eight parts of linseed oil, by putting them together in an earthen vessel, and raising the temperature to between 226° and 278°. This solution, when cold, is laid upon the surface of the stone buildings by means of a brush. The advantages of this process are numerous; among them I may mention, the great ease with which it is applied; the preservation of the normal appearance of the stone, and the rendering it quite impervious to damp and air, the two great distroyers we are seeking to oppose. Buildings protected by its use are always free from depositions of soot and dirt, (which so much destroy the beauty of those erected in our large towns) and once treated with this composition, the process will not (like paint) require to be repeated.

That my composition is one of those substances which act merely mechanically is perfectly correct; but what does Mr. Smith want more? it answers the purpose for which it is intended. If we could form artificial in the interstices of the natural stone, we should no longer require the services of the quarrymen; we should prepare our blocks on the spot and of the dimensions required. Mr. Smith proposes, and Mr. Ransome appears to support him, in making it a matter of necessity, that a chemical change should be effected in the stone or other material operated upon with a view to its induration. Experience compels me to differ from those gentlemen. And I am convinced that to effect the object intended by the various methods now under consideration, it is a neutral mechanical, and not merely a purely chemical medium which must be employed as a universal panacea, if no reference is to be had to the constituents of the various stones to be operated upon; for instance, a certain chemical combination might answer admirably upon a sandstone, or a stone composed almost entirely of carbonate of lime, whereas, the application of the same mixture to a magnesian limestone would produce a very unsatisfactory result.

All chemists agree that sulphur, the substance used by me to give body to the linseed oil, is unalterable in the air, and unacted upon by moisture; if there is any change, it rather improves the colour of the stone to which it is applied, as is shown by the experiments in Old Palace Yard, adjoining Victora Tower, the statue of Captain Coram at the Foundling Hospital, and other places. It has been proposed to wait eight or ten years before applying anything to prevent the stonework of the Houses of Parliament from decaying. Any person may judge of the wisdom of such a proposition by picturing to himself its probable state at the end of that period, if it goes on perishing at its present rate. I have no doubt but that the stone was the best that could be selected in the absence of the test of the London atmosphere. All that science, research, and experience could suggest was brought to bear upon the question; and it now remains that one more step shall be taken—viz., to use the best means that can be devised to preserve the magnificent structure.

Mr. Clarke, Visitor, observed that some time ago, Mr. Rochas brought forward a process which was essentially the same as that of Mr. Ransome. He (Mr. Clarke) had not carried out his experiments so far as he could wish, but he had investigated that process, and it appeared to him that the only action of the silicate of potash on the stone was mechanical in filling up the pores, and so preventing the action of air and moisture; and that no chemical change took place from subjecting carbonate of lime to the action of silicate of potash.

Mr. Page described a process of induration he had adopted for upwards of twenty years, which consisted in the application of a solution of potash and lime, and afterwards of bees'-wax, introduced by means of turpentine, naptha, and other fluids. The mixture was applied with a brush, and the process was as easy as white-washing. He produced a number of specimens, showing by the stains in the stone, that this preparation could be made to penetrate to from one-eighth to two inches, and even to completely saturate the stone. He had applied it to upwards of 400 works in Birmingham, Wolverhampton, Bilston, Liverpool, and other places in the Midland Counties, and on examining those works in the course of last winter, he found that where the stone had only had one coating, it had stood as well as where a dozen coats had been applied.*

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* A Communication from Mr. Page states that bees'-wax is the main ingredient, in connection with potash and lime, in his patent. It is known that nearly all oily, greasy, and resinous substances do indurate to a certain extent; but the true character of bees'-wax is not so much known as it ought to be. Forty years' experience in making up nearly all these substances into different cements, has shown him that bees'-wax is the only one which can be relied on to stand for a great number of years. Twenty years ago he began to apply different gummy and resinous solutions to the face of monumental

The Rev. Mr. Owen said, that he had attended the meeting to bear testimony to the fact that Bath stone and marble, treated by Mr. Page's process had, to his personal knowledge, successfully withstood the effects of a very smoky atmospere for sixteen or seventeen years. In the churchyard of St. Mary, Bilston, might be seen a monument, in which the front of the stone had been thus treated, and the back left unprepared, and whilst the former was in a state of rotteuness, and falling away in every direction, the front was perfectly sound, and the inscriptiou npon it perfectly distiuct and clear.

Mr. Barnabas Barrett described his process as consistiug of the application of a solution of sulphur, after the stone had been placed in an exhausting chamber so as to produce a vacuum. A different mode of treatment was necessary in different cases. Thus, at Holland House, where the stone was so dilapidated that it would hardly bear the application of the brush, he had first applied the solution of sulphur, and afterwards a mixture of resin, oil, and shellac, which was laid on hot, with a brush, and which became as hard as the stone itself. The cost of his process was about one penny per superficial foot. Mr. Barrett exhibited specimens of stone and chalk, induratad by his process; the latter of which he stated had become as hard as granite. It was not necessary to clean off the injured face of the stone before applying the solution; thus the original appearance of the work had been carefully preserved at Holland House.

Mr. G. R. Burnell, C.E., said, it appeared to him that the preseut discussiou had taken a rather unpractical turn. The durability of the monuments of Nineveh, as coutrasted with those of our country, was due to the difference of climate. The failure in the Caen stone employed at Buckiugham Palace and elsewhere might have been foreseen; as that material was utterly unfit to be employed in any situation where water could lodge upon it, or be taken into it by capillary attraction, such as the upper parts of cornices, window cills, plinths, &c. Mr. Ashpitel had alluded in the previous discussion to the precautiou adopted by Sir C. Wren, of exposing the blocks of stone required for St. Paul's Cathedral, upon the sea-shore, for three years before they were employed in the building. It was evident that during such a period some kind of chemical change must go on in the stone, and that the effects of the first winter would exhibit any inherent weakness in the stone. Of the various processes of induration which had been mentioned, some were mechanical and some chemical. He thought the application of any coating of oil or other matters objectionable, inasmuch as they were subject to a different action from temperature to what the stone itself sustained, and there was consequently a tendency in such superadded bodies to detach themselves from the stone. His own opinion was, that no system could permanently succeed, unless it acted chemically upon the stone, and converted it in to an insoluble material. The processes of Mr. Kuhlmann and Mr. Ransome professed to do this; but whilst each of them asserted that by his own process the silicate of potash converted the carbonate in the limestone into a silicate of lime, he coutended that the process of the other merely resulted in depositing a powder in the interstices of the stoue.

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work, in order to obtain a durable oil blacking without stain, and without the necessity for painting the letters singly with a brush. Finding, at length, that bees'-wax was the only article to be depended on, he adopted it, and subsequently discovered, accidentally, on holding a piece of marble to the light, that the solution had penetrated a quarter of an inch, to which depth the marble was impervious. Mr. Smith, in his paper, states that oils and greasy substances lose their protective or unctuous consistency in a few years, and what little is left is the stearine or solid wax. The application of Mr. Page's process is simple, either to the largest building or to the smallest specimen; but small works can be done by means of a slight wax-melting heat, which saves the expense of the fluid; while, for out-door work, the fluid must be used, one coat of which, properly applied, would be sufficient, and would cost about as much as painting; but, should it be thought necessary to ensure a deeper saturation—say to the extent of half an inch—more coats would have to be laid on, and the expense would be proportionally increased. The time-coloured surface of an old building would not be disturbed, only washing it with a slight application of acid and alkali being requisite, to clean it before laying on the wax solution.

Whilst the doctors thus disagreed, it appeared most desirable that a proper and official investigation should take place by a competent committee, whose report would be far more satisfactory to the public than any description of particular patents by the inventors themselves, or any such general discussion as could take place at a meeting of the Institute.

Mr. Dines, Visitor, said, that with regard to Buckingham Palace Mr. Cubitt had not chosen the stone employed. He never liked the stone, nor had he ever used it elsewhere; but when its adoption was decided upon by others, he used every precaution to get good stone, and took every care in selecting it. It should also be remembered that at the time in question the properties of Caen stone were not so well understood as the labours of Mr. Donaldson and Mr. Godwin had since made them.

Professor Tennant concurred in many of the remarks of Mr. Smith and Mr. Witt, but believed they had not sufficiently considered the nature of the different materials employed for building purposes. He considered it a matter of regret that builders should continue, from the force of habit only, to employ the same material again and again, although better stone might be obtained at less cost, and within a much less distance. Moreover, there were many valuable building stones which had been almost entirely neglected by modern architects and engineers; amongst them, the syenites, the elvans, and a large proportion of the granites, as well as the different varieties of flint, and the quartz rocks. This neglect was the more remarkable now that the increase of railway communication so greatly facilitated the conveyance of building stones. He had seen a church lately erected with an inferior kind of stone, brought from a considerable distance, and which did not appear to him likely to last more than a hundred years; whilst the material, to be had within a distance of a few hundred yards in the mere rubbish of the rocks (used only for repairing the roads) would have built a church which would have stood a thousand years at least. Professor Tennant sketched upon the board the composition of the oolite formation, and made some remarks upon the effect of solutions injected into it from the surface.

Mr. Whichcord, Fellow, observed that the syenites and flints referred to by Professor Tennant, were so extremely hard, as not to be available for the ordinary purposes of builders, who would otherwise be glad to use them. The great object of the present discussion was to ascertain how far soft stones could be made durable, within a reasonable limit of cost. Many of the suggestions offered were of great value, but a report from the Institute at large, or from a committee, would be exceedingly desirable.

Mr. Witt added some further remarks of a scientific nature in reference to the supposed formation of silicate of lime by the process of Mr. Rochas, in a pulverulent state, and stated that it is deposited in a gelatinous form.

Mr. Ransome stated that he differed from those who considered that silicate of lime was formed by the application of a solution of silica to stones composed of carbonate of lime. He had strong reasons for believing that there was no perceptible combination between the lime and the silica, but simply that silica was produced in the form of a powder. By the addition, however, of a second solution of chloride of calcium, a different material was formed in the stone, which possessed great density in itself, and a degree of hardness amounting almost to indestructibility, so far as the effect of the atmosphere was concerned. It should not be forgotten that in addition to limestones, other building materials, such as silicious stones, and others, of a friable nature, required some process of a preservative character, and in those cases there could be no doubt that the application of a solution of glass could only produce a mere precipitate of silica.

Mr. C. H. Smith, Hon. Mem., in reply upon the discussion generally, expressed a wish that Mr. Witt had more carefully read the paper which had led to the discussion, as it appeared to him, that Mr. Witt had only referred to such parts of it as suited his own views. In submitting the table

of materials consisting of the same chemical elements, he (Mr. Smith) had especially guarded himself by stating that a combination of the same proportions did not necessarily produce the same body; a statement which Mr. Witt had entirely misrepresented. He admitted the injurious effect of carbonic acid (which in its action, upon limestone especially, he had himself illustrated at the Institute,) but it was almost impossible to detect its influence at all in the atmosphere of the country, or at the top of St. Paul's Cathedral. It was certainly less than 1 per cent. (Mr. Witt.—Very far less, but most important, nevertheless.) Sir John Soane had been in the habit of constructing chimney caps of Portland stone, and although there was a quantity of carbonic acid from the fires, and a great deal of rain water, these chimney caps, when taken down, were found to be as perfect as any other part of the building. In like manner, the quantity of sulphuric acid in the atmosphere was scarcely appreciable in its effects. With regard to the silicatization of stone, he did not deny that it could be accomplished. He had only referred to cases in which it did not appear to have completely answered. This was inevitable in all new processes, and he believed the process in question was now succeeding better than at first. He admitted that he had been concerned in the selection of the stone for Bridgewater House, and under his orders eighty tons of that stone had been sent back, to the discredit of those who had sent it, because it was unfit for use; and if he (Mr. Smith) could have done as he pleased, he would have rejected it all.

Mr. H. H. Burnell, Associate, read a letter from M. Viollet le Duc, in reference to M. Rochas' method of silicatization:—"At Notre Dame, Paris, all the old decayed parts which have been thus treated, four, three, and two years ago, have acquired a hard surface, capable of entirely resisting atmospheric influences. Stones, in a crumbling state, and in which the daily decay was perceptible, have shown no signs of change since the treatment which has rendered their surfaces hard, close, imbibing no moisture, and consequently free from moss and lichens. The process that we have more particularly employed is that of Messrs. Rochas and Dalemagne—that adopted by Mr. Kuhlmann was not so effective. They apply the silicate by means of small pumps, which causes the fluid to enter further into the stone. Success in these operations depends much upon the nature of the limestones, those of Paris being dry and porous are particularly disposed to absorb the solution, as are also those found in the department of the Oise. Rich limestones are much more difficult of treatment. At the Cathedral of Amiens I have also succeeded in silicating the chalk of which this monument is composed. From the above, it must not be understood that this process can be at all times employed: on the contrary, it is only with those that have the qualities I have named that it can be attended with success. The silicating should be done in fine weather, when the stone is free from humidity, and after the application the stone should be well washed with water to remove the surplus potass. It is certain that complete success has attended that done at Notre Dame, Paris, and at Amiens Cathedral. At Havre, also, I have been successful in some experiments." This process, Mr. Burnell stated, had been very largely used in Paris, especially at the Louvre, &c. The English patent had expired, and he strongly urged all who were interested in the matter to examine carefully the works now in progress in Paris.

The Chairman, Mr. Godwin, Fellow, called upon the members to express their thanks to the gentlemen who had afforded such valuable information, and for the good temper and courtesy with which the different inventors had brought their statements before the meeting. It could not be doubted that good would result from such a discussion; and although it was somewhat distressing to architects to find themselves embarrassed by conflicting opinions, they were justified in hoping that with the assistance they had had on this occasion, they might soon arrive at a clear opinion on the comparative merits of the different processes which had been brought before them.

The meeting then adjourned.

REPORT of the Committee, appointed by the Council of the Royal Institute of British Architects to examine the Soulages Collection, and report their opinion, whether it would be expedient to recommend its purchase by the Government; read at the Ordinary General Meeting, February 9th, 1857.

Your Committee have to report that, pursuant to your instructions, they have attended twice at Marlborough House, and have also at various periods individually inspected the Soulages Collection, and compared the specimens contained in it with those derived from the sale of the late Mr. Bernal's effects, and other sources. They have experienced the utmost attention on the part of the authorities and officers of the Department of Science and Art, who furnished them with copies of the admirable report drawn up by Mr. Robinson,* and afforded them every facility of access. Before entering upon any criticism of the collection itself, your Committee think it desirable to allude briefly to the influences, which such a collection may have upon the tastes and studies of the architect, and to the share, which architecture, as the controlling spirit of decoration and ornament, has had in eliciting productions in which art and industry are harmoniously combined. For the illustration of such questions, the collection now under notice, containing specimens, ranging generally between the Fifteenth and Seventeenth Centuries, of elaborate works in almost every material applicable to domestic use or embellishment, offers subjects of rare importance, meriting the most serious consideration of all, who would fain anticipate for this country an advance in the arts of design coincident with the great strides, which have been made of late years in science and material prosperity.

SOULAGES COLLECTION.

The enlarged views in regard to Architectural Decoration, which have recently revived the taste for ornamental design, that some centuries ago was so prevalent in England, render it necessary for the architect of the present day to enter upon new fields of study; to seek for new sources of inspiration; and to acquaint himself with all the formulas of conception to be found in the productions of other branches of science and art than those which are directly structural, in order to qualify himself to take that lead in directing public taste, which his position and vocation call upon him to assume. It is indisputable, that in every age the sources of design for all classes of manufacture have been identified with the productions of the architect, and frequently derived from his conceptions. Among the ancients the fictile vases and the bronzes may be quoted in illustration of this fact, as constantly borrowing their ornaments from the buildings of antiquity; and in the Mediæval period, the pillars, the buttresses, the carving, the panelling and architectural divisions, all of which were applied to *fittings* of every description, were adopted from the structural details of the edifices, often with little or no reference to material, or other proprieties of adaptation.

As the Architect's development of the artistic element is the highest applicable to the common purposes of life, it is obvious, that the revival of obsolete sources of decoration demands the utmost circumspection. To acquit himself conscientiously of such a responsibility, he must neglect

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* The instructive notes and observations appended to each class of objects, introduce the reader at once into a brief history and analysis of each division. It is impossible to over estimate the additional instruction, which the publication of such Catalogues confers upon the casual visitor of Museums and Collections in any way analogous to the Soulages.

no means of information—he must underrate no style, no object, no department, which may contribute to those harmonious effects, which it is his province to endeavour on all occasions to ensure. He must enter upon a new career of thought, and acquaint himself with the history and fluctuations that have distinguished each phase of the origin, development, and decay of every class of applied ornament: so as to adapt it with propriety, taste, and originality, as an ever fresh idea, and not as a mere "rifacciamento" of existing forms.

Collections, like those of M. Soulages and of the late Mr. Bernal, are of the utmost value to the Architect, reflecting as they do the arts, manufacture, skill and taste of various countries and periods; and shewing their application to the ordinary uses of life in the several grades of society. No less remarkable are they, when set in contrast with the industrial practice of the first quarter of the present century, a period of singular barrenness in technical design, since they serve to bear only a more vivid testimony to the extent to which art was applied in the most trifling and ordinary utensils and objects, during those palmy days of Italian grandeur, when were executed the majority of the specimens of which those collections consist. During such periods the sentiment of art would appear to have been absolutely necessary to commend the productions of the skilled mechanic to general acceptance. And it is remarkable to observe that taste never became the exclusive property of any one department or class of productions, but reigned an universal element; the decline of purity in any manufacture, being but the sign of a general and concurrent deterioration in every other. Such Collections represent a world wide school, in which to form an universal rather than a particular standard of National taste; and thus the student is freed from the trammels of that confined view of style, which the traditions of any one period, limited within a narrow geographical circle, would bind around him. France, Italy, Germany and England have furnished their quota of excellence in many ways to the specimens now brought together in Marlborough House; and from the very distinctive peculiarities, which characterize the various productions, a wider field is afforded for the wares of the manufacturer of the present day, fresh tastes are excited, and an earnest longing is created in the purchaser for the possession of more refined and excellent productions; raising them above mere mechanical results, enlarging their sphere of application and necessarily stimulating production.

There can be little healthy progress in National manufacture, so long as the commonest and mere material wants only have to be satisfied; but directly cultivated taste seeks for superior execution and more refined elegance, enterprise and skill are enlisted in the gratification of those tendencies, progressive improvements constantly arise, industry and commerce gain by the movement, and the material prosperity of those engaged therein necessarily follows.

ENAMELS.

There are many arts, which once flourished in this country, and which have been applied only in a very limited manner within a century or two, while there are others, which have never received in Great Britain the development of which they are capable, and which in other countries have been productive of very important results. Enamelling was at one time extensively used in England, as we may see on the metallic monuments in Westminster Abbey, some of the recumbent figures of which were covered with elaborate ornaments of this nature, as also the Heraldic Shields occasionally inserted in brasses. It is now almost entirely confined to smaller works of the jeweller's craft, or elaborate reproductions of choice pictures and portraits: whereas in the Bernal and Soulages Collections are to be found medallions, and plates of considerable dimensions, and the art applied to tazze, inkstands and salt cellars, enriched with most delicate arabesques and historical subjects. Such specimens give renewed

hope that we may ultimately realize, at moderate cost, the process of enamelling on slabs of lava, brought under the attention of this Institute some years since by our Honorary and Corresponding Member, Mons. Hittorff, now President of the section of Fine Arts of the Institute of France, or medallion portraits of a nature somewhat similar to those introduced in the façade of the Academie des Beaux Arts at Paris, by Mons. Duban. There seems no reason, if public taste afforded the encouragement, why enamelled panels might not be successfully introduced as an architectural decoration, durable as to material, brilliant in color, and unchangeable in effect. A notable instance of such an application of enamel existed in the famous Chateau de Madrid in the Bois de Boulogne, Paris, which has been the theme of praise by all writers who have mentioned it. The façade was adorned with enamels 5 ft. high by 3 ft. 4 in. wide, nine of which still exist in the Hotel de Cluny.* Were such panels capable of being multiplied at a moderate cost, we might from time to time introduce in our buildings a series of all but imperishable portraits of our sovereigns, of eminent men and historical characters; not as in past times confining the subjects of such enamels to the twelve Cæsars, the labours of Hercules, or such pedantic abstractions, but adopting themes from our own poets, writers and historians; and these would come more home to the feelings, and commemorate for popular honour and respect those celebrities, who have illustrated our own history and have rendered eminent services to our country.

MEDALS.

Medal die engraving is at present of very restricted application, being generally limited in this country to too small a class of objects; and little patronage is bestowed upon what was among the ancients, and after the revival, a most important department of art production. The medals and coinage of antiquity are upon a par with the productions of Phidias, Lysippus, and Praxiteles; and the coins of Sicily and many towns of Greece, the medals of Alexander and his successors, as well as the Roman Imperial series, reflect the genius of the brightest eras of antique taste and skill. Of scarcely inferior merit were the Italian medals: and the medallions of various sizes—whether cast or struck—of the fifteenth and sixteenth centuries, are full of intense meaning, handing down to us, with the utmost vigour and refinement of expression, the lineaments of the great, the noble, or the illustrious of those periods..

Of such gems, the Soulages collection contains 106 specimens, chiefly of Italian and French art, struck or cast, presenting many varieties of treatment, and suggestive of an useful application of such memorials in modern times, combining valuable æsthetic results with historical records of an almost imperishable nature.

GLASS.

The brilliant progress, which has been made in the manufacture of glass in this country within the few years, that have elapsed since the removal of those fiscal restrictions which arrested all improvement and threw this country behind others, invests the articles of this class in the Soulages collection with great interest. Without entering into the technical processes of the "laticinio," "vitro di trina," "millefiori," "aventurine," and "schmelze," some of which are already practised in England, we may at once confidently predict, that the study of choice specimens like those presented to view in Marlborough House will lead to the development of new combinations, which will some day distinguish our English manufacturers as much as, if not more than, their Italian or

* It is said that some were purchased by Englishmen, and are now in this country. It would be a great service to the arts if they could be discovered, and exposed in the Great Exhibition about to be opened at Manchester.

Bohemian predecessors. The rapid advance in the scientific manufacture of glass, and the new applications of that material, which have recently been brought to light for the supply of architectural requirements, are alone sufficient to convince us, that this art is capable of the utmost development through English enterprise.

BRONZES.

The 106 objects in bronze, comprised in the Soulages Collection, illustrate a class of manufacture hitherto of very limited application in England; whereas, in her Eastern Dependencies, the artists in bronze for centuries past have produced, even in common utensils, elegance of form and unrivalled decoration in metallic inlay. This latter elegant process, which was of essentially Oriental origin, was eagerly adopted by the Venetians, and re-produced in their Damascened ware.

Tens of thousands of French artizans are maintained by their skilful treatment of bronze, now an essential article of furniture in that country, and purchased with avidity in England and indeed throughout Europe and America. So unpractised are our founders in the successful casting of such delicate objects, and so deficient are we in educated chasers and finishers, that we have to depend mainly on foreigners for the supply of small bronzes. Their production by English manufacturers is, indeed, so costly, that the Art Union of London (who for many years devoted much attention to the subject, and at great expense brought out various statuettes and busts), anxious as that body are to encourage the art, have been almost compelled to abandon the attempt to any great extent, and only persevere under the most discouraging circumstances. The beautiful works of art in bronze, so abundant in Paris, find no rivalry here. And we feel, therefore, that the acquisition of the specimens in this Collection, although far too limited for the urgent necessity that exists for the supply of good models in this branch of industry, would be desirable, as tending to draw public attention to this important and neglected branch of art manufacture. We do not venture to class them in design or execution, with the matchless productions of antiquity, such as those preserved in the Museum of the Studij at Naples—or even with modern ones of the highest class of art—but still there are many objects gracefully composed, elegant in form, and especially suggestive of improvement in those departments of domestic economy, into which they might be introduced with propriety.

DECORATIVE FURNITURE.

There are 100 pieces* of furniture and textile fabrics, consisting of chairs, cabinets, coffers, tables, buffets, dressoirs, metallic mirrors, a magnificent lanthorn, the cornice of a room, three pairs of bellows of tasteful design and execution, and an elaborate chimney-piece. These present a store of useful and applicable articles of various merit. Some few are carved with considerable skill, others are distinguished for their general design, or graceful proportions. Some have been considerably repaired or modified by inferior hands, but others remain intact. The buffets and armoires are suggestive, and admit of easy application to our present uses. The chestnut-wood coffers, the marriage-chests of Italian history and romance, have evidently originated in a superior class of artists, and the metal mirrors, with their carved frames, are graceful illustrations of a curious variety of domestic utensils. In all these articles it is necessary to discriminate between the production of the manufacturer who repeats, and the treatment of his material by the artist who originates. We may still be enabled to recognize clearly those forms and expressions of original ideas, vulgarized by the common taste of those

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* Artistic in general effect are 660, 670, 691, 698. Nos. 655, 656, are to be praised for their design and execution; and 670, 671, for exquisite design and workmanship.

who repeat, or demand repetition; for, although coarse in parts or gross in detail, they may still retain some of the elements of that antecedent period, when livelier imagination, more refinement, and truer sentiment prevailed. The textile fabrics contain some very elegant ornamental patterns, and several curious specimens of embroidery.

MAJOLICA.

We have reserved for our concluding remarks the most numerous and most important section of this collection, namely, the Majolica, and enamelled earthen and stone wares, consisting of one hundred and sixty-eight pieces.* We shall not enlarge upon the mutual relations of art and material, nor upon the extent to which all branches of fine art are influenced by the materials employed. This is especially perceptible in the earthenwares of Greek art and Majolica, in contrast with the porcelains of Asia and Europe, and their works in this class are as distinct as the earths of which they are composed. Nor do we pretend to review the various processes of manufacture, nor the mysteries of the glaze and brilliant lustres, which give so much attraction to these admirable productions, such as the metallic reflexions, the changing colours, the mother-o'-pearl of Gubbio, Urbino, Pesaro, Caffagiolo, Faenza, Castel Durante, or of other Towns or States of Italy, where the enlightened patronage of the Dukes and Princes to these wares realised a reputation, that could hardly otherwise have been acquired by places of such secondary importance. The earlier pieces of Majolica retain much of the noble simplicity of form and richness of decoration of their Hispano-Moorish origin; and the later ones have a higher aim than the porcelains of Germany and France, whose art decorations occasionally present a fantastic and capricious application, and generally a minute and highly-wrought elaboration by superior artists, almost too precious for the frail material upon which it is bestowed, limiting the products to the tables only of the most affluent.

The Majolica on the contrary, admits, when once the design is settled, of a rapid execution by practised secondary hands; by this economy in the production most carefully designed objects may be brought within the means of the humbler admirer of art. This series includes some choice specimens† of Bernard de Palissy's skill, and embraces every class of object fitted for the table, or to adorn the buffet or dressoir; such as plateaus, plâques, vases, plates, fruttiere, tazze, trays, or baskets, cups, flasks, bowls, ewers, sauce-boats, salt-cellars, and other articles. The finest of these are grouped in one case, and constitute a series of the highest æsthetic value, as regards their form, the combinations of colour, and treatment of decoration. They are available as types, or may be considered educationally as specimens to be followed, improved, or varied—there is not one which is not valuable for the one or other purpose. The success may be problematical of any attempt to derange the predilections and established favour, with which the public have been accustomed to regard certain articles of use in common life; but we believe that the public mind is prepared and anxious to adopt a higher state of art-treatment in such objects.

Without advocating for a moment a blind adherence to any of these forms, or the modes of decoration, which distinguish these wares, in which occasionally the execution may not rise to the dignity of the subject—in which extravagance may now and then have usurped the place of good taste, and in which noble forms may be here and there applied to inferior uses—we may clearly

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* Very satisfactory in point of design are the arabesques around Nos. 1, 2, 4, 5, 7*a*, 7*b*, 7*c*, 28, 29, 35*m*, 38, 38*r*, 41, 43, 15*k*, 15*h*, 15*l*, 66, 72, 75, 76; and in form as well as in decoration, 86, 88, 92, 105, 108, 110; and as works of real art, 3, 6, 8, 9, 82.

† Very high in style of conventional ornament, in design, execution and effect, are 138, 142, 143, 144.

recognise so much that is noble and brilliant,—so much that is full of feeling and expression, and such an appeal to a higher intelligence, as to warrant our maintaining distinctly, that access to such examples must improve the taste of the people, and elevate the aspirations of every mind for something better than those we already possess. This consummation we are indeed justified in prognosticating, (from the successful efforts in Majolica made by the firm of Minton for the Paris Universal Exhibition of 1855,) our own countrymen on the banks of the Trent and the Severn are fully able to attain. From those exertions we may reasonably contemplate that in a few years, by the teaching aid of such examples as those contained in the Soulages Collection, by the union of manufacturing skill in the manipulation with artistic power in the embellishment, and by due encouragement from the public, Majolica will become in this country a most attractive and very important branch of art production, and eventually compete with the ceramic works of any period and of any country.

In conclusion, we have to report that we are unable to contemplate, without the deepest regret, the possibility of such a collection being broken up and scattered into various channels. Each individual piece has its own peculiar value or merit: but when combined with others, as illustrating either the theory or history of art, so as to complete the chain and connexion of manufacture and art illustration, and thus forming a series of the progressive excellence to which such productions have been carried in times past, their worth is much enhanced. If Government were to rely upon the chances of a sale, they would probably be outbid for the best articles by wealthy individuals, who will gratify a taste at a fancy price, and thus the Museums of the nation would have in such an event only the chance of obtaining secondary articles, purchased at greatly enhanced cost.

In making this report, the Committee have deemed it more advisable to submit their opinions, based, after a careful examination of the objects, upon a broad and general consideration of their importance as a whole, and as a commencement and very desirable contribution, with the series obtained from the Bernal Collection, towards a large and complete historical and artistic museum, rather than upon a minute criticism of any individual specimens. And they have come to the conclusion, that it would be an irreparable loss of a great opportunity to improve our manufactures, to enlarge the sphere of art application, to increase our commerce, and instruct the public mind, if the Government did not accept the offer to sell the whole to the nation at cost price:—an offer so nobly made by the disinterested and public spirited men, who, with singular generosity, and on their own responsibility, have at all risks afforded the opportunity to the country of securing the collection in its entirety.

T. L. DONALDSON, Chairman.
S. ANGELL.
A. ASHPITEL.
TALBOT BURY.
BENJ. FERRY.
E. I'ANSON.
T. H. LEWIS.
A. SALVIN.
G. VULLIAMY.
T. H. WYATT.
C. C. NELSON, } Hon. Secs.
M. D. WYATT, }

January, 1857.

A BRIEF MEMOIR OF THE LATE ALEXIS DE CHATEAUNEUF, HON. AND COR. MEMBER.

By Charles Fowler, Jun., Associate.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, Feb. 9th, 1857.

Alexis de Chateauneuf was born 18th of February, 1799, at Hamburgh, where his father, one of the old French nobility, had taken shelter at the Revolution, and married. His only son, the subject of this memoir, after completing his school education, was, by his own desire, afforded an opportunity of learning the practical part of his future profession in the workshop of a builder, while he devoted his spare hours to the study of mathematics. In 1816 he acquired the rudiments under M. Wimmel, town architect, and in the following year went to Paris to pursue his studies at the Academy, but finding that he did not derive the advantages expected, he removed to Carlsruhe, where he applied himself assiduously for three years in the atélier of Oberbaurath Weinbrenner.

Having thus thoroughly grounded himself in the elementary knowledge of his art, he commenced, in 1821, a tour through the south of Germany and Austria to Italy; where he visited all the most important remains of antiquity, and devoted himself to their study, remaining in Rome above a whole year.

In 1823 he returned to his native city, and commenced his professional career by carrying out the town residences of Syndic Sieveking, and his brother, the Senator, besides minor works. He also spent much time at the neighbouring Hanse Town Lübeck, the interesting old buildings of which he appears to have studied very carefully.

In 1828 he visited England and France, and part of Germany. On his return he designed and carried out the Town Post Office, the country seat of the Syndic Sieveking, and other works. In the first-named building, which abuts upon one of the principal canals, he made a bold experiment by omitting the foundation of piles, universally used in the old town, and substituting an arrangement for floating the structure on the soft boggy ground. This, though not altogether successful, at least shows that M. de Chateauneuf was not content to plod on in the beaten track, but that he endeavoured to adopt all modern advances in scientific construction.

In 1832 he again visited Italy, and soon after his return (about 1835), while the impressions of his visit to that classic ground were fresh, he designed the residence of Dr. Abendroth, an eminent connoisseur and liberal patron of the arts. This building, although not on a very large scale, may be considered his chief work, as it affords evidences of great skill in adapting a very effective arrangement of plan to an irregular site, and of refined taste in combining Greek purity of detail with the structural forms of Italian Renaissance. In the interior especially every part, even the smallest detail, bears the impress of a master hand.

In the years 1838 and 1839, M. de Chateauneuf passed much time in England, engaged, in conjunction with Mr. Mee, upon a competition design for rebuilding the Royal Exchange, to which the second premium was subsequently awarded. He was also, I believe, assisted by the same gentleman in the publication of a 4to. work, "Architectura Domestica," London, 1839. To another small work, "The Country House," by Lady Mary Fox, published in 1843, he contributed some excellent designs for a country mansion. The letters which accompany these designs contain many remarks shewing

how carefully he had studied the general principles of his art, and the correctness of the views he entertained of the vexed question of style in Architecture.

The great Fire, which in May 1842, destroyed a large portion of the old town of Hamburgh, opened a wide field for the labours of the architect, and it may be safely affirmed that no one strove more assiduously or successfully than M. de Chateauneuf to carry out the restoration of his native city. A commission having been appointed to remodel the plan of the destroyed quarter, he was nominated President, and many of the important improvements effected were originated by him; among which may be specially mentioned the arcaded porticoes by the side of the Alster Canal, and those flanking the square of the Exchange; the former were also subsequently carried out from his detailed plans.

From this time to about the end of the year 1850, M. de Chateauneuf was largely engaged in the erection of numerous buildings, both public and private; among them the rebuilding the great Church of St. Peter, in which he was associated with Prof. Fersenfeldt, the residences for the clergy, and other buildings connected with this church, the new Post Office, the large warehouses, with residences for Messrs. Schulte and Schemmann, and for Mr. Davenport, the Hall of the Tailors' Company, a large warehouse for the Cabinetmakers' Company, and numerous private houses in the town and suburbs. Many of these buildings show great originality both in arrangement, and in the details of the mouldings and enrichments, for which M. de Chateauneuf always made numerous studies. The beautiful details of English Mediæval architecture appear to have made a strong impression upon him, the influence of which may be clearly traced in the works executed subsequently to his visits to this country.

In 1846 he married a Norwegian lady of Christiania, and on paying a visit to that city, the restoration of the Church of "The Redeemer" was entrusted to him; he was also employed to prepare a design for another church, which was subsequently carried out from his plans by a former pupil. Although still in the prime of life, he began now to feel the effects of constant application upon his naturally earnest and somewhat excitable temperament, which, combined with some domestic afflictions, caused his health visibly to decline. He made, however, another great effort, and produced one of his grandest architectural conceptions in the design submitted in competition for the Storthing Haus at Christiania, which, however, was not carried out, as the estimated cost exceeded the proposed expenditure. This was his last work, and it formed a worthy termination to his professional labours.

In 1850 it was found advisable to place him under the care of Prof. Sessen, in a private asylum near Kiel, which had been erected from his designs; he subsequently, however, returned to his native city, where he died on the 31st of December, 1853.

Throughout his life his energetic character led him to feel a lively interest in all public affairs, and he took an active and leading part in the local Kunstverein (Art Association), and the Society for encouraging Arts and Manufactures; he was also an Honorary and Corresponding Member of the Royal Institute of British Architects. He was thoroughly devoted to his profession, and, an accomplished artist himself, he took great delight in the society of his brethren of all classes, whom he frequently consulted on the subject of his principal designs; thus promoting that reciprocity of action so desirable between the sister arts. Those of foreign countries always met with the kindest attention and hospitality at his hands, and he had thus procured the warm attachment of a large circle of friends, by whom his premature death will long be regretted.

A vote of thanks having been passed to Mr. Charles Fowler jun. for the Memoir,

Mr. Donaldson, H.S.F.C., proceeded to give a description of the streets proposed to be formed by the Metropolitan Board of Works. He observed that as the attention of Parliament would soon be called to these projects, he thought it might be interesting to the Members to be made acquainted with them, and he was happy to be able to submit the engraved plans, which had some time since been kindly presented to the Institute by Mr. Marrable. The first and shortest of the new lines was the one on this side of the Thames, its purpose being to connect King Street, Covent Garden, with Leicester Square. It had been long felt, that there was not a sufficient access to Covent Garden Market and Drury Lane Theatre from the West End, and that much confusion was produced by the great traffic in that neighbourhood, especially during the business of the market in the morning, and at night, when the theatres were open; it was also considered very necessary to form the communication so as to continue Cranbourn Street to the Strand, and also to relieve St. Martin's Lane of the traffic between Tottenham Court Road and the northern parts of London with the Strand; and accordingly it had been proposed some years ago by Mr. Pennethorne, under the direction of the Commission for Metropolis Improvements, that a new street should be made in an oblique direction from the east end of Cranbourn Street, at its juncture with Long Acre and St. Martin's Lane, to the west end of King Street;—a line which appeared the more eligible now that the east end of Leicester Square had been opened by the enlargement of Cranbourn Street. On the other hand, it had been suggested, that the line of St. Martin's Passage and New Street would be more desirable, and more direct; but by adopting that line, it would interfere with a much longer line of house property, and involve the necessity of widening an established thoroughfare with a particular class of business (which would incur an enormous expense), and would not provide for the north traffic; and the plan of Mr. Pennethorne, although it was a more abrupt detour than could be desired, would be generally admitted to meet, to a great degree, the difficultics of the case. The Duke of Bedford had offered to contribute some £15,000. towards it; and the plan was sanctioned by the Government Commissioners. But when the new Metropolitan Bill was passed, and the Central Board was organized, all former proceedings were superseded, and Mr. Marrable was ordered to make a fresh survey and estimate. Mr. Marrable, however, after due consideration, arrived at the same conclusion as Mr. Pennethorne, with regard to the route; and his estimate of the cost of the new street was as follows:—

Outlay.	£.	Return.	£.
Purchase of Property and Contingencies	90,570	Sale of Ground Rents	45,600
Cost of Sewer	4,250	Old Materials	1,200
			46,800
		Difference of Cost	45,020
	£91,820		£91,820

Mr. Donaldson next adverted to the importance of a direct communication from the western parts of London to the Borough, the Railway Termini at London Bridge, &c., in order to avoid the difficulties of the route through the city. Referring to the different plans exhibited, he called attention to the fact, that the existing line on the other side of the river of the York Road and Stamford Street constituted the greater portion of the communication now projected by the Metropolitan Board: and that a continuation of the latter street eastwards to the Borough would complete the line. One project to effect this latter section between Blackfriars and London Bridges was along the south bank of the river [as shewn upon the map]; but any line of this kind must pass either under or over Southwark Bridge Road, which would be very objectionable, and there-

fore such a route was dismissed from the minds of most practical men; as, in addition, St. Saviour's Church offers a great obstacle; for the church itself would be more lost to sight than at present, or must be entirely pulled down. But a proposed line more southward would also interfere directly with the Borough Market, Messrs. Barclay's premises, and other property, which no man in his senses would think of touching for such a purpose. Mr. Donaldson next described the line proposed by the Board of Works [referring to the map], which commenced at a point north of the Town Hall, Southwark, and terminated opposite the east end of Stamford Street. This line is necessarily curved, in order to avoid, whilst closely infringing upon, the College, Alms Houses, Messrs. Barclays' premises, Messrs. Potts' Vinegar Works, Hopton's Alms Houses, the premises and market of the Hop Planters' Company, Messrs. Easton and Amos' Foundry, &c. The estimates for this line were as follows:—

Outlay.	£.	Return.	£.
Purchase of Property	510,549	Sale of Ground Rent	165,390
Sewer	8,875	Property re-sold, and Sale of old Materials	33,363
			198,753
		Difference, or nett Cost . .	320,671
	£519,424		£519,424

But towards this cost there was already about £90,000. in the hands of the Government. Contrasted with the above plan, Mr. Donaldson described [referring to a map] the route laid down by Mr. Pennethorne in 1853, being a straight line from a point near the Lambeth side of Hungerford Bridge, which it is proposed to widen to a carriage way, passing close to the north side of Surrey Chapel, direct to the Town Hall in the Borough. This line it was also proposed to continue eastwards to Bermondsey, and westwards by a curved line to the Surrey foot of Westminster Bridge. The main portion of the line passed through a very inferior description of property,—the estimate made by Mr. Marrable being as follows:—

Outlay.	£.	Return.	£.
Purchase of Property, Good will, and cost of Sewer	895,104	Property resold, Sale of Ground Rent and old Materials	631,794
		Difference, or nett Cost . .	£263,310

Mr. Donaldson briefly referred to another admirable project by Mr. Pennethorne, in 1844, for a line direct from Westminster Bridge to St. George's Church in the Borough, on through Bermondsey, which would then be opened up to general traffic; as also to another scheme for widening the existing line of the New Cut and the streets beyond Surrey Chapel westward to the Borough, as a cheap method of meeting the required object. He concluded by impressing upon the Meeting the superiority of Mr. Pennethorne's plan over that about to be submitted to Parliament, as being shorter, more economical, and as bringing into more direct play and communication Westminster, Hungerford, Waterloo, Blackfriars, and London Bridges.

Mr. Jennings, Fellow, suggested, that it was almost as important to provide a communication from Waterloo Bridge to London Bridge, as from the West End: and further, that a line skirting the water was greatly required;—especially with a view to the improvement of the river side property, between London and Blackfriars Bridges.

The thanks of the Meeting were voted to Mr. Donaldson for his communication.

Mr. M. D. Wyatt, Hon. Sec., having read the Report of a Committee appointed by the Council of the Institute to examine the Soulages Collection, and report as to recommending the purchase of the same by the Government.

Mr. Talbot Bury, Fellow, observed that the articles of decorative furniture in the Soulages Collection were of particular value and interest in an historical point of view, as elucidating the progression and amalgamation of the different styles.

Mr. J. G. Crace, Contributing Visitor, said that the public were much indebted to the Institute for deputing the Committee to examine and report on this Collection. When he first heard of the existence of the Soulages Collection he had been most anxious to ensure its purchase by the English nation, and had, accordingly, assisted in forming the Guarantee Fund for bringing it to this country. He confessed that he was rather disappointed that the Collection did not contain more specimens of decorative furniture (in which case it would have been more to his own taste); but such objects were very difficult to be obtained. He specially admired the specimens of Majolica—which were not only interesting in themselves, but highly suggestive to artists—the arabesques and other designs upon those works reflecting the minds of the most able men of the age in which they were produced. To show the extent to which this kind of material might be employed in architectural decoration, Mr. Crace referred to the state rooms of the Medina Celi Palace, at Seville, the walls of which, from the top to the bottom (twenty feet high), were covered entirely with tile work of the most beautiful patterns: these works, although within a week's journey of England, were entirely unknown to English architects. The mirrors in the Soulages Collection were extremely interesting. Besides the circular mirror (of which a photograph was before the meeting), there was a square one on the table in the first room at Marlborough House, which was remarkable for delicacy of expression; and in another specimen the decoration consisted of simple lines inlaid in ivory, showing that whilst the style of the period was in general remarkable for an abundance of ornament, yet that occasionally the artists of the period were content with a severe purity of taste. The chairs of the X form were exceedingly interesting, as representing a type which was perhaps 1,000 years old, and which strikingly recalled the Gothic feeling of many examples to be met with in England. There were also some chairs inlaid with ivory, in a manner which only practical men could thoroughly appreciate. The difficulty of this kind of manufacture was very great, and the excellence of the workmanship must have been quite as great, to enable them to have lasted in such perfection for 300 years. The cabinets and buffets were good in their way, displaying boldness of execution and the touch of a master—although, perhaps, not of the highest class. These works could not fail to be highly interesting to English workmen, who would readily perceive the superiority of their mouldings to the everlasting ogee and other standing forms to which they had been restricted. It was to be hoped that the minds of masters also would be affected in a similar way, and that the practice of putting together mere packing cases, with cornices copied from King William Street, would thus be abolished. He believed that, even in a commercial sense, Government money could not be better spent than in accumulating objects of this description for educational purposes. The collection of the Hotel de Cluny, at Paris, far surpassed any collection yet formed in England, and furnished a strong stimulus to exertion in this country. Furniture to the value of many hundred thousand pounds, and silks to the value of millions, were annually exported from France—not because such objects could be produced there more cheaply than in England, but because they were stamped with a degree of taste which English works did not possess. It was most desirable that the Government should, by every possible means, enable the English manufacturer and artist to compete with those of foreign nations.

Mr. Donaldson made some remarks on the importance and interest of the Soulages Collection, and on the variety of ideas which it furnished, and which might be applied in various ways, and to other styles of art. He referred particularly to the dressoirs and buffets, with their acroteria and other ornaments, as contrasting most favourably with the ordinary side-boards of the middle class in England. A great amount of design and invention was also exhibited in the chests and coffers in the Collection. The chairs referred to by Mr. Crace were modelled after the curule chairs of the Romans.

Mr. M. D. Wyatt, Hon. Sec., stated that copies of the Report had been forwarded to the President of the Board of Trade and the Chancellor of the Exchequer, in the hope that the purchase of the Soulages Collection might be considered in the Government Estimates.

ON BEAUTY IN ARCHITECTURE AND ITS ALLIANCE WITH THE PAST.

By John W. Papworth, Fellow.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, Feb. 23d, 1857.

Some of the following remarks may appear to be equally adverse to the views entertained by both the parties engaged in the theoretical or practical battle upon the question of style; it must therefore be allowed me to use a plea, fairly set out in the "Athenæum," that to a large mind all forms of art have a meaning and a beauty. There is no necessity to pit the Gothic against all others. Each style of architecture arose from the desire to engraft beauty upon necessity, and its existence is a proof of its use.

Art is "catholic" by being "universal," or "extending to all;" Geometric Middle Pointed architecture is to be judged by the same laws of criticism as Flowing Middle Pointed architecture; First and Third Pointed are amenable to those laws, as well as Renaissance and Romanesque, Palladian and Roman, in short, as well as all other styles that have ever existed, or may be produced. If this be true, there ought to be somewhere a code of æsthetics, and this it was my endeavour to find before venturing in 1843 to offer to the Institute an essay in answer to its question—Are synchronism and uniformity of style essential to beauty and propriety in architecture? In the search it was natural, besides consulting Reynolds, Quatremère, and others, to look into Pugin's "True Principles of Pointed or Christian Architecture;" but this work contains nothing that is universally true and not to be found in Vitruvius. To be convinced of that fact it is unnecessary to go further than the first page of Pugin's book, where we find that "the two great rules for design are these—1st. That there should be no features about a building which are not necessary for convenience, construction, or propriety. 2nd. That all ornament should consist of enrichment of the essential construction of the building;" and Pugin adds, "the neglect of these two rules is the cause of all the bad architecture of the present time." Now, according to the analysis of architecture given by Vitruvius, a design which provides all the essential requisites, so far as expense and circumstances will permit, thereby fixing the general scale of the composition, which proportions their sizes to their uses on this general scale, and which arranges them in the most convenient manner, is complete in the *utile;* if it also affixes graceful proportions to all these parts, entwines them with a unity of ratios, so far as is consistent with their usefulness, and then places these graceful parts in good relative positions, maintaining consistency throughout, such, we say, is a perfect design, so far as art can make it. These operations of the architect are, or ought to be, subservient to one consideration, and controlled by one principle, viz. the unity of action of the mind. There will be no difficulty in apprehending this principle; it is one of those truths whose demonstration we readily find within ourselves. The mind appears to apprehend by one and the same intuitive act, both the form of a body and the colour with which that form is invested; but it can only enjoy, one after the other, the impressions produced by the form and the colour. It is not indeed impossible to catch in conversation a few words from two persons speaking together, but no one can follow out the reasoning of two speeches delivered at the same time; so, also, in the pantomimic art, or what remains of it, we hear the musician and see the performer of the ballet, but to one only can our attention be given.

Whatever tends to prove the "unity of action of the mind," and the impossibility of its being so divided as to pay attention to two concurrent sensations equally, also establishes the law of "unity"

in art, whether considered with regard to the respective properties of the several Arts, or with regard to the elements of which the work of an individual art is composed. By this law of "unity" the artist is obliged to maintain "uniformity," or an "even tenour," in the composition and execution of his works in order to render them clear, intelligible, and harmonious to the eye and satisfactory to the mind of the spectator. Closely connected with this "even tenour" of the whole is the principle of the "conformity of two things to one pattern, which is "uniformity" in the popular notion of the meaning of the word "symmetry," viz. a parity of parts; this requires similarity, or rather an almost identical repetition in the wings of an edifice as much as in the arms of a man. The number of other cases which might be cited is very great, but two more will be sufficient, viz. something more than a balance, actual repetition, is required for ornaments often repeated or prominently displayed, and for buildings opposed to each other, in certain situations. Should there occur any capricious disorder, the impression made on the mind will be much too weak to produce even an agreeable sensation. It will only be requisite to cite as examples the appearance of some approaches to bridges, compared with those that are uniform, or with the admitted effect of a divided crescent or terrace, and the irregular, incongruous, disjointed appearance of an edifice in which the wings are of unequal length, height, or arrangement; to which may be added, the incomplete effect of a building which has a mass at one end of its front, as was so long the case at the corner of Downing Street and Whitehall.

As each of the fine arts must have its "unity" or "uniformity," so each must have its corresponding "variety." If "variety" be confounded with "universality," if an over-estimate be made of the power of the mind in its combination of objects, and an excessive freedom be thereupon allowed to taste, then every work will necessarily present a complication of designs, instead of a well arranged design, and the mind with its utmost attention will hardly be able to grasp them. If "variety" be considered as synonimous with other words, expressive either of a different idea, or of the same idea under very different relations, and any artist should think of mingling styles, periods of a style, or local peculiarities of a style, let him imagine a poet combining in one work two languages, or two periods of a language, or the refined and the vulgar of the same period. The outcry raised in all countries against those who powder their discourse with foreign terms for which there are native equivalents, should warn the architect against falling into a similar error in his own art, and prevent the application of detail formed to suit the requisitions of one style to a design invented in other feelings of composition. The same law, known in other arts, as propriety of costume, and exampled by the practice of our standard writers, should guide the architect when, amid the stores of ornamental decoration offered for his selection, he runs the risk of choosing details peculiar to an early period of a style, and introducing them into a composition invented in the spirit of the perfection of that style, and vice versa.

It is questionable whether any change of style, or of detail, beyond what actually occurs during the execution of the design, is not a violation of truth and probability; and whether the converse is not equally just, namely, that any addition or restoration (renovation) made after the execution of a building, except in a totally different style, is not an act that is somewhat fraudulent to our contemporaries and to posterity. Let me introduce to your notice the sentiments, on this subject, of the Council of the Society of Antiquaries, and of the Ecclesiologist Journal, which last authority (v. 7, p. 161), observes that there are but three systems of conducting a restoration, viz., the Destructive, the Conservative, and the Eclectic. Our ancestors seem to have universally followed the first or Destructive course, which is that recommended by Mr. Ruskin; they were of course right; they took no care of the original style, arrangement, and proportion, but sacrificed any earlier work to their own feelings of preference for development. We must imagine what would be said if some

works were destroyed on such grounds by any living architect. As for the "Eclectic," this is preferred by the Ecclesiologist, because it is so very vague a course; there are absolutely no rules to teach us when to venture to destroy, when to be content with restoration; indeed, the only rule would seem to be the silent assent given to the proposal for destruction. The "Conservative" course reproduces the exact detail of every piece of ornament which presents itself; as to this course, which looks at first sight, as the Ecclesiologist pronounces it, the safest, we must read the following memorandum as drawn up by the Executive Committee and approved by the Council of the Society of Antiquaries of London:—

Restoration.—The numerous instances of the destruction of the character of ancient monuments which are taking place under the pretence of restoration, induce the Executive Committee, to which the Society of Antiquaries has entrusted the management of its "Conservation Fund," to call the special attention of the Society to the subject, in the hope that its influence may be exerted to stop, or at least moderate the pernicious practice. The evil is an increasing one; and it is to be feared that, unless a strong and immediate protest be made against it, the monumental remains of England will, before long, cease to exist as truthful records of the past. Much as these monuments have necessarily suffered from time, and much as their decay is to be attributed to the neglect of their owners, the members of the Committee have no hesitation in expressing their conviction that (*since the Conquest*) these two causes combined have inflicted less injury than the indiscreet zeal for restoration. Though time and neglect may impair, and eventually destroy, they do not add to a building; nor do they pervert the truthfulness of monuments. Restoration may possibly, indeed, produce a good imitation of an ancient work of art; but the original is thus falsified, and in its renovated state it is no longer an example of the art of the period to which it belonged. Unfortunately, too, the more exact the imitation, the more it is adapted to mislead posterity; and even the best imitation (probably *meant for "restoration,"* or *"such imitation"*) must unavoidably impair the historical interest and artistic value of the prototype, so that, in truth, a monument restored is frequently (*it might have been said "always"*) a monument destroyed. Did the public at large really know how imperfectly the principles and practice of ancient art are understood, and how very few of the so-called restorations have any just pretensions to fidelity, or could they appreciate the rash presumption of those who in general recommend and undertake such work, much less would be heard of money being lavishly spent in thus perpetrating irreparable mischief with the best intentions. The Committee strongly urge that, except where restoration is called for in churches by the requirements of divine service, or in other cases of manifest public utility, no restoration should ever be attempted, otherwise than as the word "restoration" may be understood in the sense of preservation from further injuries by time or negligence:—they contend that anything beyond this is untrue in art, unjustifiable in taste, destructive in practice, and wholly opposed to the judgment of the best Archæologists.

There is evidently a sentence wanting—some few words to the effect, that what the chisel spares in cutting the drag destroys in scraping; and, at the present rate of restoration, we shall not have, fifty years hence, a trustworthy monument of antiquity.

If beauty be the assemblage of graces, then the philosophical definition of beauty would be fitness, harmony and character; each of which is only a phase of what we understand by the word "propriety." On this propriety rests my conviction that "synchronism" (or uniformity of style, uniformity of locality, and uniformity of period) is essential, as well as "uniformity" of general and of particular features, to the highest class of beauty in architecture:—that the two alone do not constitute beauty, is possible. "To the highest class," for there is a class of beauty in architecture, to which the observance of the laws arising from the foregoing principles does not appear to be

necessary, according to its adherents. The experience of every age shows that in all the relations of enjoyment we regard, with extraordinary indifference, perfection itself, when that limit is reached to which mortal efforts may attain. While proclaiming the authority of his name, as the founder of a school of pure drawing and invention, the scholars and successors of Raffaelle, from their anxiety to surpass what was simply excellent, insensibly changed the style of Italian Art, by the production of a series of fascinating novelties, from which alone they could hope to attain, of their contemporaries, that approbation with which they were rewarded.

The consequence in architecture of this passion for change is the existence of a double beauty in the art: one, the sensuous beauty of the painter; the other, the mental beauty of the architect. While the first admits of a licence which constitutes one of the chief attractions of the Mediæval and of some of the Eastern styles (though in these only a certain amount of irregularity is admissible); the last, which, for want of a previous distinguishing appellation is here termed Sculpturesque Architecture, demands synchronism and uniformity. The influence of the first sort of beauty exerted on the passions through merely visible or sensuous means consists in lightness; in intricacy of form, light, shade and color; in variety of tints; in irregularity; and to some extent in mixture of style. Irregularity is certainly an ingredient of beauty, so far as it affects the organs of sense only; and, as it is admitted by both Payne Knight and Price, this species of architectural beauty is that which painting can, and which sculpture cannot, express. Painters delight not only in irregular trees, but in irregular buildings; and in buildings irregularly mixed with trees; which afford more variety of tint, and more luxuriant play of light and shade, than any regular combination of parts can produce, though that may be required by the understanding in other instances. The sentiments produced by the other are the approved effect of a general discriminative judgment, sound feeling, and refined fancy, implanted in the mind of man, and improved by exercise, study, and meditation.

The efforts of the one (which has received the name of Picturesque Architecture) lead to the same end, and produce the same vitiation of taste, which prompts the neglect of the best masters for the performances of Teniers and similar painters; pictures with which our galleries are crowded, not so much for the beauties of their coloring (which might form an excuse in many cases, for the partiality of the purchasers, had the wealthy great the knowledge to appreciate them), as for the gratification of a fashion introduced by that sensuous taste which in literature revels in the mysterious, the horrible, the romantic, the disgusting, and the vulgar. But it belongs to Sculpturesque Architecture to embellish and aggrandize the thoughts, whose impression it stamps on the material, in proportion as it wishes to induce in the spectator grand or sublime ideas of the edifices which it constructs; to this end it uses those principles of beauty developed in the preceding analysis, while it must be guided by the laws which form their corollaries, in exhibiting harmonious yet brilliant and contrasted combinations of light and shade, blended but not confused, and broken (not cut) into masses. That this division and distinction between the two species of beauty in architecture may not seem hypercritical or disingenuous, we must avail ourselves of an opinion expressed with the full approbation of Pugin, an artist well known for, perhaps, a too partial feeling for picturesque architecture. The Rev. G. A. Poole (Lectures, 1842,) says: "The senseless uniformity of modern design is one of its greatest defects. The idea of everything being exactly alike on both sides, has created an unreal style of building which was quite unknown to our ancestors. When once the trammels and bondage of this regularity system are broken through, and people are not taught to consider a portico and two uniform wings the perfection of design, we may expect vast improvements." Here is the opportunity of asking the supporters of this doctrine whether a man, that noblest work of creation, looks well when he has lost an arm? For the last time we will notice the way in which words are made to supply the place of

reason. If the author just quoted had left out his epithets, the passage would fall harmless on any ear, the fallacies would be palpable; for we should hear with astonishment an ecclesiologist pronounce that a nave with an aisle on each side, and a transept of equal arms, with a tower at each corner of the western façade, was defective by virtue of its uniformity, and that we might expect vast improvements by lopping off one aisle, lessening one transept, and putting a spire on one of the towers. Certainly when the artist appears to sacrifice just expression to what he may term grandeur of form and outline, or to a vicious, or rather to a sensuous, desire of embellishment, he must be working against the resources which his art offers to him. Form, considered in the abstract, *i.e.* divested of character, is neither grand nor mean; else since the effect of the Farnese Hercules is comprised in the exhibition of great, but quiescent, muscular power, it might be expected that exaggeration of the parts would produce greater dignity, whereas the result would exhibit the disgusting appearance of a bloated pugilist. Nor can he then deeply interest the mind of the spectator by beauty, of the highest order, arising from ideas and contrivances happily expressed, and springing from the circumstances, the incidents, and the requisitions, of a consistent whole.

The blind admiration with which works in both species of architectural beauty are regarded, precludes all discrimination on the part of either the feeling or the judgment. Mr. Street, in summing up the results of his last journey, informs us that "Greek architecture was the art of men in a state of nature, unskilled in science, but well skilled in lovely outlines, and possessed of a most delicate appreciation of form; rude, therefore, in their contrivances and construction, but delicate and refined in all their ornamentation; its followers wasted labour incalculable in the placing together of great blocks of stone or marble, so as to bridge the necessary openings in their walls, and then lavished with a noble bounty all their art in the decoration of what would otherwise have been the clumsy masses of their buildings. Gothic architecture, on the other hand, was essentially the work of scientific men; the most consummate skill being displayed in arranging thousands of small blocks of stones, any one of which might be carried upon a strong man's shoulders, into walls rising far in height above anything ever dreamt of by the Greeks, bridging great openings, and providing (by the exact counterpoise of various parts) for the perfect security of works whose airiness and life would seem to have lifted them out of the region of constructive skill; and yet all these wonderful works were executed in materials as ponderous in their nature as those which the Greek had handled so rudely in construction, and so delicately in ornamentation. The natural result of this excess of science was, perhaps, that less delicacy and beauty of detail became necessary; for when the plain rough walls, without carving and without ornament, were of necessity so beautiful in their intricacy of outline and delicacy of structure, and when too so little (comparatively) plain surface remained to be looked at or dwelt upon, men cared less for the choicest examples of the sculptor's art, and were less obliged to satisfy the eye with them." Such systematic unfairness seems rather habitual in some writers led by fashion. Not to be delighted with what the artists hear in general terms is fine, might argue a want of capacity on their part to comprehend, or a want of taste to relish its merits; to avoid such an imputation, there are the resources of decrying the merit of the style least in fashion, and to applaud that which is most in vogue; to escape the probability of censure, or from an excessive and shameful indolence, they copied, and still copy precedents without consideration; concluding that every peculiarity, whether understood or not, is one of excellence, and never reflecting that if a beauty, it might be of a sort that any artist could easily display, and that all good artists would anxiously avoid.

The advocates of the round-arch and pointed-arch fashions agree in accusing each other of "copyism;" as many disputes would never arise if the meaning of the term employed were understood, this part of our subject is worth some brief attention. The truth seems to be that under all the

declamation about "the right style in the right place," a principle is mystified, viz. eclecticism in architecture, in other words, what is to be considered copyism? Let us hope that architects are agreed upon one point, that any building will be good that shows elements, proportions, and details, which are agreeable in themselves, and to each other, as well as suited to the materials, expense, and purpose prescribed. Now, if bronze or marble is to be employed, delicate work in the details can be obtained; these must be bolder where iron, plaster, or finely grained stone is used; a coarsely grained stone requires larger work; brick allows few mouldings; terra-cotta is almost extinct with us. These details may belong to any style, or period of a style, or be novel if that be possible; at any rate, those who charge others with copyism, allow that to have precedent for details separately is not copyism; such is my own opinion. Then as to expense, when a wall will stand without buttresses, such features should not be added *ex post facto* for mere decoration; we do not build thick walls, therefore face-ornament must be chiefly employed; we do not like to see damaged work, therefore the ornament which is within reach must be flat; the usual range of the eye is about twenty-five feet, therefore work above that height from the ground must be large in its detail, unless polychromatized; some appear to think that it is not copyism to employ a style to which these and similar principles are opposed, but such is not my own opinion. And, lastly, as to purpose: we shall perhaps have some day better reasons than those above given, why bargeboards and French casements are theoretically abused and practically adopted; why a Byzantine villa is not as good as a Moresque, a Greek, or a Mediæval one; why a Classic edifice should not be covered with pointed panelling; why orientation should be observed; why a church in any style should not be lighted solely from the top; why buildings of cast iron should not necessarily have pointed details and ornaments; and lastly, why churches should not be built of cast iron.

Probably we have arrived at an explanation of "copyism," and if my views are right, we mean not the mechanical repetition of a building, for example, the tower of St. Mary's, Taunton; but the reproduction of the leading features of a building in the same combinations with each other. This copyism has several stages: as when the plan and the elevation alike repeat the original with only slight modifications; or when the plan is almost the same, and the elevation more than slightly differs; or when the elevation is almost the same, but applied to an altered plan; these, if detected, are all stages of copyism: and this copyism, however it may be disguised, is called servile, partial, or free, as the case may be; it does not matter whether Sta Maria in Rotundo, or S. Andrew's Heckington, is the model. Common sense is not to be imposed upon by the word adaptation; if a building be more or less a copy, it is popularly and correctly called a copy. Every one knows that the plans of theatres are copied from preceding ones, with such alterations as experience has suggested; no one accuses the architect of copyism; the fact is known, but he obtains due praise for the adoption of the recent improvements; if the architect were to reproduce the classic theatre, he would be a servile copyist. Every one can understand that a modern barn is very different from one of the last century; if an architect were to repeat one of the fifteenth, he would be a servile copyist. Every one feels that the usual high four, six, or eight columned portico is a reproduction of part of a bygone system, that it is almost useless, and is only employed traditionally; it is the disposition to reproduce this and other types of the classic ages, which has caused the round-arch fashioner to be called a servile copyist. Every one is aware that churches after the Reformation did not require to be duplicates of some built just before that period; that parts of them are useless, and are only employed traditionally; it is the disposition to reproduce the Roman Catholic Church and other types of the middle ages, which causes the pointed-arch fashioner to be called a servile copyist, and in both cases the reproach is just.

This fatal aptitude for copying, does not carry with it that power of adaptation and combination which is requisite to raise the result to the rank of a design; but the ignorance, or the indolence of the artist, stamps all his works with a similarity of character, and he may easily get a reputation for an individual manner, by undeviatingly reproducing, as in a mirror, the deformities which only belong to the individual edifices which have been his models; thus reducing the works of art to mere casting from a mould. A tedium, like that which seizes us in a city where the streets are uniform, is the fruit of this error of confounding "uniformity" as identical repetition, with "unity" as the conformity of two portions to one pattern, the second definition applied above to the word "uniformity."

It will perhaps be noticed, that no mention has been made of association; such a term can have little place in a code of asthetical criticism; if the thing be in itself beautiful, it is a joy for ever; and it should be thought unadvisable to assail it as proceeding from artists who have no Christian feeling; artists are tempted to retort upon their opponents that the attack comes from men who have no true Christian feeling—there is surely no evidence, in such a course of argument, of charity or of wisdom; and the course itself is as absurd, in relation to architecture, as it would be with respect to the latinity of Professor A's diction, opposed to the nervous Saxonisms of Professor Z's language. For myself, I should be disposed to hail the most violent self-assertion of another species of movement, that of an independent body of architects, who would design buildings according to the purpose, materials, and expense provided, without copyism from any former type; this is the only way to develope a new style, or to develope an old one, which is the same thing. But it is useless for architects to talk of developing an old style when such arguments are used and circulated as have lately been put into our hands. It has been intimated to us, in answer to the cry "Mediæval churches are unsuitable to the Church of England," that the spirit of their style depends upon their composition, by which is meant their plan and appendages; and thus it is admitted, that the plan and its appendages must be copied, servilely copied; yet, if the charge of copyism is objectionable, some should not assert, that "if the essential requirements of a church are simply that everybody shall hear, see, and be seen, there must be an end of all internal composition." This could only have been said by gentlemen who do not choose to seek precedent in primitive and pure Christian architecture for basilican auditorium, with absis, narthex and atrium, and who choose to forget our college-chapels and lady-chapels, with the churches of the Preaching Friars and of the Jesuits. The society of Jesuits, the great advocates of the Roman Catholic tenets, has indeed hitherto employed some of the strangest fashions of the round arch styles, and its churches have generally, I think, had galleries; but it does not therefore follow, that the round arch style and the galleries are unsuitable to the Church of England. Perhaps all will not be inclined to agree to an expression of opinion, that so far as devotion is concerned, it does not matter whether a round or a pointed arch is used in a church; and that so far as taste is concerned, every one should be at liberty to design what he feels suitable to the occasion, nay, even to copy an existing building, if he will confess that his own resources fail him.

For my own part, I venture to adopt, with modifications, another passage from Mr. Street; a correct adherence to the feeling of the established style employed (and not to particular types or characteristic features), with proper decorations in proper places, free from licentious liberties, free from pedantic copying, free from unnecessary repetition, free from ill-executed detail, and free from superfluous embellishments, has at all times, and will always constitute the manner of a great architect; it affords sufficient scope for the exercise of his genius, without allowing him to pass the line which separates imitative variety from universality. The true architects of all ages had in short an intense respect for natural laws, with an equally intense love for experiment and realization, and to these it is that we owe the true nobility and abiding beauty of their works; nor need we in this age despond, for

if we be really in earnest in our work, there is nothing which we need fear to miss, nothing which we may not possess if we will, and nothing therefore to prevent our working in the same spirit, and with the same results as our predecessors of the last three thousand years. If a subject be correctly understood, and properly felt, it will of itself supply the mind with appropriate expressions, for the mere use of the pencil, necessary to acquire practice sufficiently copious to enable any person to sketch and draw well, will provide forms in propriety and abundance, if the architect has memory to retain, and judgment to select them; if he has not these, works upon the art, theoretical, critical, historical, or topographical, will never give him either, though they may teach him to substitute fashion for feeling—artifice for nature—and affectation for simplicity. Not to be wearisome—

'Tis just congruity of parts combined,
Must please the taste, and satisfy the mind.

Τὸ γὰρ καλὸν ἐν μέγεθει καὶ τάξει ἐστὶ.—*Aristotle Poetic*, ij. 4.

Mr. M. D. Wyatt, Hon. Sec., said that although the remarks of Mr. Papworth were exceedingly interesting and valuable, he regretted that that gentleman had appeared to abjure the principle and the value of looking at style through the association of ideas. Alison, the greatest writer on the subject,* had followed out with great ability and propriety the exact progress of the mind when first perceiving the advantage of uniformity of proportions, and feeling at such a moment the disconnection of ideas of harmony arising from any divergence from regularity. Alison had shown that the first impulse of the savage in reference to ornament was towards uniformity. His first effort in art was to carve the two sides of a piece of wood or stone in uniformity with each other. But as the mind became educated, there arose a tendency to diverge from uniformity in a degree constantly increasing in the ratio of artificial life, until at last it resulted in the strangest license, such as that which permitted the broken curves of the School of Borromini and similar excesses. Through association of ideas a natural relation in different forms was to be found, which it would be wise for architects to consider. Certain forms were indissolubly associated with certain sentiments, as the pyramid or triangle with solidity; the circle with fulness and plenitude; the oblong or extended parallelogram with elegance, &c.; and on examining these families of forms, they were found to be intimately connected with particular historic styles of art. Hence it was that synchronism became so essential in architecture; because throughout each style some particular feature was predominant, and gave the key note of the style. Hence, in reproducing any particular style, the architect might divest himself of the actual detail, so long as he retained the geometrical principle, which was itself the foundation of the style. For example, he who would restore monuments in which there was a high ideal character of beauty, such as the early Greek monuments, would do well to keep in his mind as the rule of the figure, either the perfect square, the parabola, or the hyperbola; he who would restore the Gothic form of art would do well not to wander far from the combinations of form and ratios arising from the equilateral triangle; and he who would work in the Roman style should keep in view chiefly the simple cylinder, the cone, and the various segmental and re-entering curves; and thus, if he would only avoid mixing those dominants he might safely work in the right style of development. He should also be guided by the structural laws deducible from the actual materials which economy or other circumstances led him to employ. Thus, if he worked in stone, there were certain forms generated by the mason's craft, which, in whatever style he worked, would always be consistent and agreeable. If he worked in metal, he must remember the forms best suited to that material, and that in employing

* Essays on Taste.

cast iron, a degree of solidity might be allowed which would not be agreeable in wrought iron. Their hope as artists lay, not in discarding laws, but rather in evolving them from necessities, and adopting them as the code and grammar of their art.

Mr. Jennings, Fellow, said that the subject under discussion depended very much upon the much disputed question whether there was such a thing abstractedly as beauty. In music there was a certain scale, and a certain harmony beautiful to all ears; and it was his own impression that there was something of the same description in respect of beauty of form, and when they had arrived at a knowledge of this, it would be easy to determine what forms were beautiful. There might still be beauties, as in music, which were not exactly harmonious—irregularities being often equally beautiful with regular forms. One great means of arriving at the elements of beauty would be to study carefully the objects which they most admired, and to find out what features in those objects occasioned the pleasant impressions on the mind; and by considering those features with a view to future purposes they would be much aided in arriving at beauty in new designs. There was great beauty to most eyes in extreme irregularity, as shown in the drawing exhibited of Salisbury Cathedral. With regard to the different forms which it was the fashion to consider beautiful at different times, he thought the only proper course was to consider the largest possible variety of styles, in order to arrive at some general principles. The beauty of St. Paul's Cathedral arose in a great measure from the geometrical proportions to be found in almost every part of it.

Mr. Papworth said that he had no doubt in the Mediæval and other early times there was a common meter or measure of some kind, which was the foundation of their designs. The way in which all the dimensions of our Mediæval churches might be divided by three feet was very remarkable, and would seem to lead to the inference that 18 inches had been the standard measure, as 13 inches appeared to have been in the French churches. With regard to Mr. Wyatt's remarks on the association of ideas, he observed that there could be no code of æsthetic education. Beauty was in the mind of the spectator rather than in the object seen, and it was impossible for all to agree on this, because it was impossible to educate all men precisely alike. Alison's theory was not that uniformity was the principle of savage decoration, but of the point at which the savage arrived when he had become civilised; and he (Mr. Papworth) had failed to recognize any uniformity in the decoration of the New Zealander's face, which had been cited by Mr. Owen Jones in his "Grammar of Ornament." There was one invariable type—that of female beauty, and it was remarkable that the hair of the female, unlike that of the male, was always parted in the centre.

Mr. C. C. Nelson, Hon. Sec., wished to ask whether in the "Seven Lamps of Architecture," Mr. Ruskin had not expressed opinions very opposite to those ascribed to him by Mr. Papworth?

Mr. Papworth said that his quotation was from Mr. Ruskin's Edinburgh Lecture.

The Chairman, Mr. Ashpitel, Fellow, said that Mr. Ruskin contradicted himself very frequently. It was, indeed, almost an insult to the public, that in the same book which enforced the system of the pre-Raffaelites, the latest works of Turner should be equally eulogized; works executed when his eyes had failed him, and which were so unintelligible that the men who had to hang them could not tell the top from the bottom. Mr. Ruskin seemed to have adopted the idea that it was necessary to do or say something startling in order to be talked about. It was not the custom, however, now for people to think for themselves, but rather to build their faith on their favourite author or newspaper, thus holding out a premium to such authors as Mr. Ruskin. He could understand that gentleman's peculiarities if he were only consistent; but his object seemed to be merely by a great deal of glittering verbiage to bring himself into notice. With reference to the drawings exhibited by Mr. Papworth, the Chairman referred to the Basilica at Vicenza, the effect of which he observed, when he

first saw it by moonlight, was very striking. This building shewed the importance of considering the site of any structure in criticising its design; because its very lofty roof, which formed a striking feature internally, would have been most incongruous in external elevation if the building had not been so placed that the roof was invisible. To reproduce such a design in an open space would be a gross blunder. With regard to beauty in the abstract, it was true that all men could not be educated to agree to call an object beautiful; but he concurred with Mr. Jennings in believing that there were some forms which must strike every eye with admiration, whether savage or civilized. After all, no rule or canon of taste of universal application could be laid down—for the most conflicting rules would often equally produce beauty. It came, after all, to the story of the two competing Greek architects, one of whom produced a most elaborate plan, of which the other said, "I cannot understand it, but I can do it—I can build the building, which I am afraid my friend cannot." These things were very much matters of intuitive perception, depending not altogether on the education of the mind, but on a peculiar acuteness of perception and tact, which it had pleased Providence to bestow upon some men more than others. All the knowledge and all the perception in the world however could be of very little use without common sense, which would best enable them to fully appreciate the beautiful, whether in poetry, painting, music, or architecture.

Mr. M. D. Wyatt begged to express a friendly protest against the Chairman's remarks on Mr. Ruskin. Those who knew that gentleman were perfectly aware that he did not make literature a profession. No one could regret or repudiate more than himself the tone of much that Mr. Ruskin had written; but it should be remembered that, if there was an awakened interest in the public mind respecting their profession, a great deal was due to Mr. Ruskin for sounding the alarm; and if he had not shown them the way to go, he had at least said, "Gentleman, you must go some way."

A vote of thanks to Mr. Papworth, for his paper, was then unanimously carried.

Mr. Fraser, Contributing Visitor, called the attention of the meeting to an article in the newspapers, from which it appeared that a suspension bridge was to be erected across the ornamental water in St. James' Park. This he considered would be a very great eye-sore. Where there were high tides or violent currents suspension bridges were most useful (as in the cases of the Britannia and Conway Bridges); and in France such bridges were properly employed from motives of economy; but over a quiet lake, as that in St. James' Park, always at the same level, a suspension bridge was totally out of place, and would by no means add to the beauty of the scene. No painter would introduce such an object in a landscape, as the pictures of Poussin, Claude, Wilson, Turner, Stanfield, and Creswick sufficiently proved. The bridge of St. Angelo at Rome, that at Prague, and that in Blenheim Park would furnish examples of what would be appropriate. These bridges were perfectly flat, the piers being continued above the parapet, and surmounted by beautiful sculpture. In this case there might be three arches in the water, and one on each bank, and there would be no occasion to raise the arches more than a few feet above the water. To introduce a chain bridge in an ornamental park was perfectly incongruous, and he hoped there would be some expression of opinion on the subject by the Institute, which would prevent it becoming the laughing stock of foreigners. Fortunately there was yet time, as the bridge was not built.

Mr. M. D. Wyatt said, that as his name would probably be hereafter associated, to some slight extent, with the bridge referred to, he would explain the circumstances connected with it. He begged to say publicly that he agreed with the general principle laid down by Mr. Fraser, and considered that a low bridge on arches, recalling the Palladian bridge at Wilton, would have been a more classic and picturesque object in St. James' Park than any suspension bridge could possibly be made. When

he was applied to by the late Mr. Rendel the matter was a *fait accompli*. Mr. Rendel's engineering arrangements were nearly completed, and it was in respect to the precise forms of all the iron work that could be made in anywise subservient to the laws of beauty, that his assistance had been invited. All that he himself had to do with the design had therefore, been to arrange the detail of the iron-work in as appropriate and reasonable a manner as possible. This he trusted it would be found he had done.

Mr. Matthews, Associate, stated that a design for a Palladian bridge had been prepared in Sir C. Barry's office; but that the suspension bridge was entirely the wish of Sir B. Hall, who over-rode the Palladian form altogether.

Mr. Jennings said he believed the feeling was that any bridge in the proposed situation would be an evil, but that a suspension bridge would be more in the nature of an invisible fence, and would not cut the park so visibly across as a stone bridge would have done.

Mr. M. D. Wyatt explained, that the moment a bridge was proposed at all the public raised a great outcry against it. This was met by the promoters of the plan with a suggestion, that it would be sufficient just to throw something nearly invisible in wire across the lake, and which would consequently be no eyesore. This was all very well in the hands of amateurs, but when they went to Mr. Rendel, he no doubt perceived that "invisibility" could never be achieved; that they must have strong points of support, and something massive to hang the roadway from, unless they would have piers in the water. He was bound to design a bridge that would stand, and had accordingly made a most ingenious design, which was a combination of the lattice with the suspension bridge. There were, of course, chains and certain rods, but as few as possible; the balustrade being a lattice, and the whole forming a very stiff and light bridge, the engineering details of which had been worked out most skilfully by the sons of the late Mr. Rendel.

Mr. Papworth inquired whether the bridge was to be painted green or blue.

Mr. Wyatt said, that his advice to the late Mr. Rendel had been to paint it grey, and if there was any money to spare to relieve certain parts with gilding.

The meeting then adjourned.

Previously to the reading of Mr. Papworth's paper, Mr. C. F. Hayward, Associate, called attention to the dilapidated state of Sir C. Wren's model of St. Paul's Cathedral, with a view to memorialising the authorities to effect a restoration, and to place it in a more advantageous position. Mr. M. D. Wyatt, and Mr. Parris, Visitor, explained that the subject had not escaped the attention and care of the Surveyor to the fabric.

Mr. Twining, Contributing Visitor, then exhibited some sketches of churches in Bavaria. The towers, he stated, were generally surmounted by small cupolas, modelled after that of the Cathedral of Munich, but modified in various ways; and it appeared to him that these cupolas, though by no means beautiful in themselves, harmonised with the rocky outlines of the Bavarian Alps much better than the spires of the Tyrolese churches assimilated with that mountainous region. The spire, in fact, was chiefly effective in flat and level countries The effect of the colossal statue of Bavaria was much impaired by its being placed on a vast plain, without sufficient underwork to elevate it and separate it from the general surface of the country. From the want of a more elevated site, it only excited interest on a comparatively close view; whereas the statue of San Carlo Borromeo on the Lago Maggiore, though incomparably inferior as to execution, formed an attractive object from a distance. Mr. Twining also exhibited sketches of the common form of the houses in the Tyrolese Alps, which although somewhat similar, differed in points of detail from those of Switzerland. The castles of the same country were numerous and interesting, but having been constantly kept in repair they did not form such picturesque objects as the castles on the Rhine. Referring to a view of the entrance to the town of Salzburg, Mr. Twining explained that it was partly built with masonry, and partly cut out of the face of the rock; and that this mode of execution might be advantageously adopted for the entrances to railway tunnels.

Corrigenda in the Discussion on the Paper read February 23, 1857—page 101, line 19—for Mr. Papworth's remarks, read the following:

Mr. Papworth said he had no doubt that in the Mediæval, as in earlier times, there was a common meter or measure of some kind which served as a foundation for design: the way in which the leading dimensions of the Mediæval churches might frequently be divided by three feet was very remarkable, and would seem to lead to the inference that 18 inches had been the standard of measure, as 13 inches appeared to have been in the French churches.* With regard to Mr. Wyatt's remarks on the association of ideas, he had previously observed that such a term could not find a place in a code of pure æsthetics; for if beauty were in the mind of the spectator, rather than in the object seen, it would be as impossible for people to agree what beauty was, as it is impossible to educate all men precisely alike. Alison's theory was incorrectly applied: uniformity was not the principle of savage decoration, but of the point at which the savage arrived when he had become civilized; and although he (Mr. Papworth) had failed to see beauty in the uniformity of the decoration of the New Zealander's face, which had been cited by Mr. Owen Jones in his "Grammar of Ornament," he would appeal to the one invariable type in Europe, that of female beauty; and it was remarkable that on that continent the hair of the female, unlike that of the male, had almost always been divided from the middle of the forehead.

Page 102, line 10, for "plan," read "theory."

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* See on this subject Cresy's Encyclopædia of Civil Engineering, Supplement.

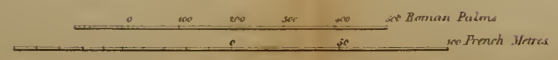
FORUM ROMANUM.

BUNSEN.

REFERENCE

Tabularium	1.
Temple of Concord	2.
" " Vespasian	3.
" " Saturn	4
" " Castor and Pollux	5
" " Vesta	6
" " Penates	7.
" " Julius Cæsar	8
" " Janus	9
" " Antoninus and Faustina	10
(the Atrium is detailed in 2 of the Plans)	
Arch of Tiberius	11
" " Severus	12
" " Fabius	13
Basilica Æmilia	14
" " Fulvia Emilia	15
" " Porcia	16
" " Opimia	17.
" " Julia	18
Curia Hostilia (then Julia	19
Grecostasis	20
Volcanal	21.
Portico of Dii Consentes	22.
" Schola Xanta	23.
" Via Sacra	24
" Clivus Capitolinus	25
" Via Nova	26
" Vicus Tuscus	27
" Thararius	28
" Jugarius	29
" Carcer Mamertinus	30
Old Rostra	31.
Column of Phocas	32
Horse of Domitian and Lacus Curtius	33.
Minerva Chalcidica (according to Bunsen)	34
Atrium Minervæ (according to Canina)	35.
Old Shops	36
New D°	37.
Fons Juturnæ	38.
Basilica Sempronia	39
Temple of Romulus and Remus	40
T. Concord of Grimius	41.
Comitium	A
Retaining Walls of the Palatine	B

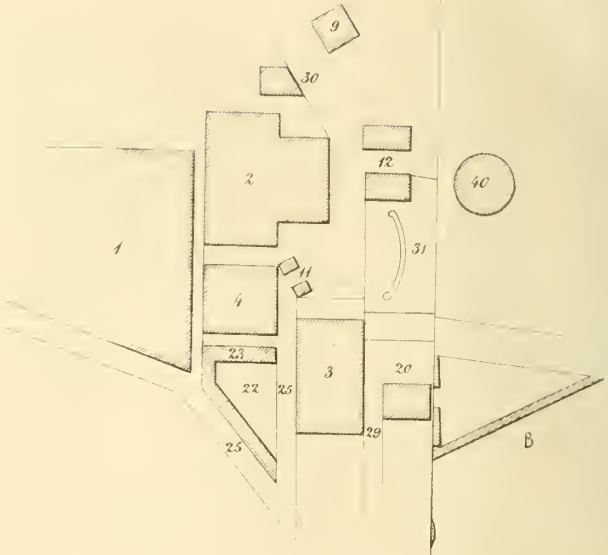
BECKER.



Vincent Brooks Lith.

CANINA.

DYER.



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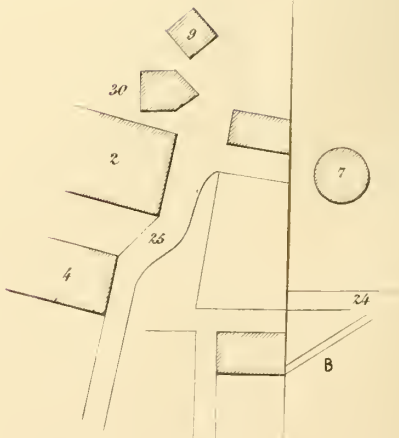
CANINA.



BECKER.

DYER.

ON THE DIFFERENT THEORIES RESPECTING THE FORUM AT ROME, PARTICULARLY THOSE OF OUR LATE MEMBER, THE COMMENDATORE CANINA.

By Arthur Ashpitel, Fellow, F.S.A.

Portion read at the Ordinary General Meeting of the Royal Institute of British Architects, March 9th, 1857.

The Forum at Rome has lately attracted the interest which a subject so important to the scholar, the archæologist, and the antiquary deserves. The most learned men among the Italians, Germans, and English, have given their utmost attention, and thrown all their powers into the investigation. Every attainable source, whether classic or Mediæval, that could throw light upon it, has been ransacked; the most abstruse authors—the most obscure inscriptions—the slightest notices—have all been eagerly seized on, and theories on theories built up, the most contradictory that can be conceived. It is, and has been for some time, the *cheval de bataille* of most great scholars; and it seems almost a reproach to any learned body that they have not devoted their especial attention, at some time, to forwarding its investigation. To me the subject has a peculiar interest, not only from its intrinsic value and importance, but because it was the favourite study of my friend, our late Member, the celebrated Luigi Canina, with whom, and with another valued friend, Doctor Emile Braun, I have walked, again and again, over every part of the site, and paused over every stone, while I listened to their discourse and discussed every theory with them. I do not think, however, that I should have ventured to rise before you to-night, but that Canina himself, just before his last departure from England, requested me personally to take some opportunity of making his views more generally known to English architects; to justify him, as far as I conscientiously could, from the attacks of his adversaries; and particularly to enlist the sympathies and support of his professional brethren in his favour. It has been too much the custom of learned men lately, from the height and in the strength of their position, to dictate to others respecting their especial business or profession. The architect in particular has been the greatest sufferer from this assumption. He is, literally, supposed to know nothing. The scholar, learned in books only, and the arrogant amateur critic, little think how a practical eye will detect fallacies which look so well on paper. In fact, it is only the union of mind and scholarship with great practical knowledge, that can lead to any satisfactory results in the investigation of architectural archæology.

It is thus that our talented Member, Professor Willis, has done so much for our Mediæval architecture—as, for like reasons, I trust I shall show our late Member, Canina, has done for that of Rome. A few short months have taken from us both him and Dr. Braun, without doubt the two best classic archæologists of the day. I think it may not be thought presumptuous in me to bring this subject under your notice, as I regard my late friend's last expressions to me as a sort of legacy, and will endeavour to lay before you the most promising points of interest in the investigation.

Before going into the history of the controversies on this subject which have occupied the learned, it may be well to allude to a few of the sources from which authorities have been derived. Of course every allusion in all the classic writers has been eagerly examined, and, in addition, the scholiasts and commentators upon them. The curious, though imperfect treatise of Varro, de Linguâ Latinâ, has been found of immense service. Of inscriptions, one of the most valuable is the Monumentum Ancyranum.

But the most useful of all have been some early MSS. in the Vatican. One is called the "Notitia Dignitatum utriusque Imperii." It is a statistical account of the Roman Empire, at the end of which is appended a description of Rome itself. The next is a MS. called "Curiosum Urbis." Both these are descriptions of the various regions or wards—fourteen in number—into which Augustus divided the city. They contain, first, the names of every public building and object of notice; then the number of streets and houses; the number of the officers appointed to them—or Common Councilmen as we should call them—the number of the warehouses, baths, fountains, bakehouses, &c.; and lastly, the measure of their circumference in Roman feet. That these MSS. are as late as Constantine is clear, because they mention his basilica; but they cannot be much later, as they contain no notice of any Christian building.

Besides these, there are two other similar catalogues, by Publius Victor and Sextus Rufus; but they are so corrupted that they are of but little authority.

Another curious manuscript was found by Mabillon at the Monastery of Einsiedlen in Switzerland. It contains the routes to all the principal churches at Rome, and, what is very valuable, the different inscriptions on the various public buildings. It is probably of the date of the 9th century, and, from its having no name, it is generally cited as the "Anonymus Einsiedlensis."

Another very curious and valuable Mediæval MS. is the "Ordo Romanus," which contains directions for the routes of the various religious processions, and in which most of the ancient buildings are named: this is supposed to be of the 12th century. Of about the same date is another, called "Mirabilia Romæ,"—or the Wonders of Rome. Both these are full of curious and quaint legends, and are only of secondary authority. On the revival of letters, critics naturally turned their attention to the topography of the city, and several works appeared in succession on the subject. Canina has given a list of more than 120 authors, whose works he had consulted—perhaps the most valuable are those of the celebrated architects, Serlio and Palladio—who have not only written much that is excellent, but measured and delineated the remains of many buildings now swept away, and thus preserved them for our use. The antiquary, Pirro Ligorio, though not much to be depended on in other respects, collected a vast number of sketches of buildings and medals, which are of some assistance in the investigation.

There is one monument of antiquity which has come down to us in a sadly imperfect state, and which, had it been entire, would have been of the utmost value; in fact, it would have decided at once all these questions, as well as many more relating to classic antiquity. It is actually an original plan of Rome, to a large scale, with every house, and, in some instances, every column indicated upon it. The names of most of the public buildings are written in bold, legible characters. It is carved, or rather incised, on white marble, and probably formed the pavement of a temple. Unfortunately the fragments are so broken, that they often tend rather to add to, than to clear up the perplexities of the subject.

It will now be well to bring to your notice the different schools and theories on this subject, and on this point also to correct some misapprehensions. We hear much of Italian and German schools of criticism. Now this is, in some degree, a misnomer; for, though most of the Italians at present hold the opinion of our late Member, Canina, yet some of the Germans (among whom, as a conspicuous instance, I may mention my late valued friend, Dr. Emile Braun), likewise adhere to his opinions. Moreover, the Germans themselves are much divided among themselves. The opinions of Becker and of Bunsen differ materially; as do those of several subsequent German writers. In England a very valuable paper has appeared in Dr. Smith's Dictionary of Classic Geography, under the head of "Roma," from the pen of that excellent scholar, Mr. Dyer. This gentleman agrees with

Canina as to the position of the Capitol, but dissents from his notions as to the Forum. In the last number of the Quarterly Review an attack is made on Mr. Dyer's opinion as to the Capitol; and in a late work the Dean of Christ Church seems to take up the views of Bunsen,—so great are the names, and so various are the opinions connected with this subject. To simplify matters, I will not call them the opinions of the German, Italian, or English schools, but as those of Bunsen, Becker, Dyer, and Canina.

Having given this short sketch of the materials from which our information is derived, let me now direct your attention to the consideration of the site of the Forum, and of the nature of the ground itself.

Rome stands, as is well known, on seven hills, which rise out of a vast plain nearly a hundred miles in length; bounded on the one side by the Apennines, and on the other by the sea. But it is not so well known, except to those who have visited the spot, that these hills are not those gentle rises and rounded forms which we call hills, but are, in fact, precipitous cliffs, separated by narrow vallies, which even now, where circumstances have led to lowering the tops and throwing down the debris into the vallies, are still inaccessible, except at certain points. They are partly of volcanic formation, and partly owe their existence to the action of water. In fact it is not improbable that there have been some vast currents rushing down between the Palatine and Quirinal, which have scarped their faces as they now exist. The two sketches show the ground of the two principal hills, the Capitol and Palatine, as they probably were when first colonized. They are about the height of the cliffs at Hastings; and the steep pathway from the back of Wellington Square up to the Old Castle, will give a very fair idea of the Roman clivus or ascent.

The Capitol, as we see, has two summits with a hollow between, called the Intermontium. Which of these summits was the Arx, and which the Capitolium, has been the subject of most ardent controversy, and will shortly have to be considered.

Without entering into the question as to how far fact and fable may be mixed, it will be sufficient to remind you that Romulus is said to have occupied and fortified the Palatine, and (passing by the stories of Remus) that the Sabines held the Capitol, which was then called (Solinus Polyhistor, 1, 11, 12; Festus 322), Mons Saturnius.

It will now be convenient to follow for a short time the history, or rather the dates of events, and the erection of the various buildings of the Forum, as they occurred.

The first building erected by Romulus was the Temple of Jupiter Stator, on the Palatine. The two armies had engaged in a bitter warfare, and the Romans were driven back, says Livy, to the old gate of the Palatine. Here Romulus rallied them, and drove the enemy back into the low ground, and entirely defeated them; on which he vowed to erect a temple to Jupiter Stator—a vow he afterwards performed—and built it, says Dionysius Halicarnassus, at the Mugonian Gate. Canina endeavours to show, from the nature of the ground, this must have been at the south extremity of the Palatine. But this has no direct bearing on the subject of the Forum, except as proving that the three columns at the upper end could not have been part of the Temple of Jupiter Stator. This must have been on the Palatine, at, or probably within, the Mugonian Gate (whether that gate might have been further up on the Palatine or not.)

At this period, too, the Sacred Way, perhaps the most celebrated road in the world, took its name from the treaty concluded upon it between Romulus and the Sabine king, Tatius. (Dionysius, 246; Festus, 290.) Along this road the sacred offerings to Jupiter were borne to the Capitol by the priests; and thence the Augurs descended to perform their duties in the city.

At this period the Forum became a common place of meeting between the Romans and the

Sabines; the country people resorted there with their goods, and made it a market; but it took no regular form till some years after, under Tarquinius Priscus. Two places, which became much celebrated in after times, were, however, set apart—and these will bear a conspicuous part in our argument.

One was the Vulcanale, or arca of Vulcan; a place—as we gather from Plutarch—set apart for the assembly of the judges. The other, and more important one, was the Comitium, or place of assembly for the comitia curiata, or Courts of the Patricians.

Tullus Hostilius erected a building, very important in the history of Rome, the famous Curia Hostilia. Here, says Varro, the senate consulted about human affairs, as they did on sacred matters in the Capitol. The senate also assembled in the Temple of Concord near the Tabularium, and also in the Temple of Jupiter Stator; but the Curia was the proper station. We shall see how different have been the opinions on this as well as the other buildings.

In the reign of Tarquinius Priscus, the Forum first had a definite shape and boundaries. This king, says Livy, first surrounded it with shops and porticos.

The next king proceeded with these different works; the last king, Tarquinius Superbus, completed the Cloaca Maxima, the great main sewer, which ultimately drained the Forum, the works of which were executed by the Etruscans.

We have now run through 243 years of the history of the Forum, and shall rapidly proceed with the important additions which remain. In 246, the Temple of Jupiter Capitolinus was finished. In 257, that of Saturn was completed, and made a treasury by Valerius Poplicola. In 270, after the battle of Lake Regillus, the legend so beautifully related by Livy, and versified by Macaulay in our own time—at the spot where the Twin Brothers gave water to their horses at the Fountain of Juturna, a temple was erected to Castor and Pollux. In 305, another incident—also sung by the same poet—the tragic death of Virginia, took place: this occurred under the new shops, close to the Shrine of Cluacina.

Sixty years afterwards came the Gauls, and destroyed everything they could, leaving Rome such a ruin that the inhabitants were nearly quitting it in despair and removing to Veii. Through the exertions, however, of Camillus, the city rose again from its ashes, and, in memory of the event, he founded the Temple of Concord, between the Capitol and the Forum (says Festus, voce Senaculum), and close to that of Saturn (says Servius, in his Commentary on the 2nd Æneid). In 410, the Temple of Juno Moneta was built upon the Arx, where the house of Manlius stood. In 449, a small bronze shrine to Concord was erected in the area of Vulcan, by C. Flavius. In 536, a temple was erected to Concord in the Arx, near that of Juno Moneta, according to the vow of Manlius. In 542, Livy records a great fire, which burnt the old shops, the Atrium Regium, the Fish Market, and much other property. At that period, the historian remarks, there were no basilicas. Very shortly afterwards the first of these remarkable buildings was erected, and that by the last man to be suspected of a wish for innovation—the famous Marcus Porcius Cato. He bought, says Livy, two large halls from Manius and Titius, in the Lautumiis (or as Canina supposes, in the Lantulis), and four shops for the public; and there he built the Basilica, which is called the Porcian.

Two or three years after this was finished, the celebrated poet, Plautus, died at Rome. He is the first writer who mentions a basilica, and he does so twice. Once, in the "Captives," he speaks of the smell of fish in the Fish Market, which was so strong that it drove the people out of the basilica into the Forum—which circumstance of course proves its contiguity to it—and next, in a passage so extremely curious, that I venture to attempt a translation of it. Though it is somewhat difficult, and in some parts obscure, it is so graphic a description of the Forum of his day, that my paper would

hardly be complete without it. It is in the play called the Curculio. The fourth act commences with a speech of the Choragus, who is supposed to be standing alone, gazing at the Forum, and thus soliloquizes:—

"And now I'll show you in what place to find
A man of ev'ry sort you'd wish to seek:
And no great trouble to me; look you round
For good or bad, modest or impudent.
You want to find a hireling perjurer?
I send you straight to the Comitium.
A lying braggart?—Cluacina's fane!
Poor devil husbands? Under the Basilica
You'll find them, where the spanking girls resort,
Ready to bargain with you: then, for gluttons,
Who club together for a savory lunch,
Go to the Fish Market: and down below,
Right at the very bottom of the Forum,
Walk your good men—your wealthy citizens.
Then in the middle, close by the canal,
Those who show samples of the purest wines:
Above the Lake, the chattering backbiters,
Relating slanders vile of other people,
That might be truly published of themselves.
Under the ancient shops, the fools who borrow,
And the hard rogues who thrive on usury:
Behind the Fane of Castor there are men—
Don't you believe them easily! and there,
In the Etruscan Street, a sort of Fellows
Who'd sell their very selves to turn a penny.
In the Velabrum there are bakers, butchers,
Or fortune tellers; cheats or cheated all,
Each in their several turns,—but hark! the door
Creaks on its hinges; I must hold my tongue."

The erection of this basilica was speedily followed by others.

In 622, after the slaughter of the Gracchi, Lucius Opimius, who was the principal agent in that tragedy, built a temple to Concord in the Forum—as we are told by Appian and Plutarch. He also built a splendid basilica, which we may suppose, from a passage in Varro, to be near this temple. In 631, the Arch of Fabius—the first triumphal arch erected in the Sacred Way—was built, in honour of the victory of Fabius Maximus Allobrogicus over the Allobroges. As to the position of this arch there are also great disputes. In 652, the Tabularium was built by Q. Lutatius Catulus: on this there is no dispute, thanks to an inscription which existed there a short time ago. In 699, the Basilica Æmilia was built by Lucius Æmilius Paulus, with columns of Phrygian marble. In 702, the Curia Hostilia—which had previously undergone some alteration by Sulla—was burnt, together with the Basilica Porcia, by the mob at the funeral of the Demagogue Clodius. The fire reached as far as the Comitium, and injured the statue of Attus Nævius.

We now come to the time of the Dictatorship of Julius Cæsar, who, finding the Forum too

small, commenced a new one, with a temple to Venus Genetrix. He then began the Basilica Julia, the position of which was first suggested by Canina, and has since been clearly determined by an inscription. He also commenced the Curia Julia, which Pliny says was on the Comitium, and Dion Cassius, near the Comitium. These works were finished by Augustus, who also built the Forum, which bears his name, with the Temple of Mars Ultor, the Temple of Julius Cæsar, and several other works.

I have now run quickly through an account of the principal buildings with their dates, a course which is almost absolutely necessary in order to make the rest of my subject intelligible. Those on which I have touched hastily will be more particularly described as we come to them.

We now see that the only buildings about which there is no doubt, are the Temple of Antoninus and Faustina, which bears its name on the front, as also does the Arch of S. Severus. The Tabularium was so inscribed in the days of Poggio. The Mamertine Prison is without doubt the old prison, from its structure, the unvarying tradition attached to it, and the inscription recording its restoration. The huge arches formerly called the Temple of Peace, are clearly those of a basilica, not of a temple; and as the Regionary describes a basilica of Constantine as standing near the Temple of Venus and Rome, we may reasonably conclude this to be the building. So far the learned are agreed. Beyond this all is matter of dispute. The three great points in this controversy, on which in fact most of the minor ones turn, are, Where were the Comitium and its adjacent buildings? What are the temples under the Capitol? which was the Arx, and which the Capitolium, on the two summits of the hill? The Comitium, as has been stated, was the place of assembly for the Curia Comitiata, or patrician assemblies, the Plebs usually assembling in the Campus Martius. Livy mentions an occasion when it was covered, "the first time," he says, "since Hannibal departed from Italy." This would seem to prove it was an open place; it was raised a few steps and had statues on it, those of Pythagoras and Alcibiades are specially mentioned on the horns or corners of the Comitium; there was also a statue of Attus Nævius, the augur, the base of which was injured by the fire at Clodius' funeral. Pompeius Festus mentions "the Vulcanal which is above the Comitium;" and Asconius, in a Commentary on Cicero's Speech for Milo, says, "the Rostra were not then where they are now, but at the Comitium nearly joining the Curia." Let us investigate what these places were, and first the Vulcanal or Area of Vulcan. This was an open place sacred to Vulcan, not a temple (for the temples to Vulcan were always outside the walls), and from a passage in Plutarch, it appears it was used for assembling the judges. Dionysius of Halicarnassus says it was a short distance from the Forum. Livy says the statue of Horatius Cocles was on the Comitium; but Aulus Gellius and Plutarch say it was in the Vulcanal. Livy also, relating the prodigies which took place before a great pestilence, says it rained blood in the Area of Vulcan and of Concord. Let us next enquire what the Grecostasis was. Varro tells us it was a "locus substructus," a raised place, a platform or terrace on the right of the Comitium, where the ambassadors of foreign nations waited till they could be received by the Senate. It was probably originally of wood; for in the Imperial times, as we learn from the Catalogus Imperatorum, the Senate, the patrimony of Cæsar, the Basilica Julia, and the Grecostasis were burnt down. It was rebuilt, says Julius Capitolinus, by Antoninus Pius, and then (from the fragment of the Capitoline Plan) it appears to have been a regular building, with a flight of steps, and a hexastyle portico in front. But as we pursue our enquiry, we find other buildings again adjacent to them are mentioned. Varro says in another passage, "there is the Senaculum above the Grecostasis, where there is the Temple of Concord and the Basilica Opimia." Now, we have shewn this Temple of Concord to have been built by L. Opimius after the slaughter of the Gracchi in 622, and that it is not likely to be the temple built by Camillus at the foot of the Capitol in 387. So that it is quite clear, that the Comitium

must have had above it (and immediately adjoining the Grecostasis,) the Area of Vulcan, the Temple of Concord, the Rostra, and the Curia. Besides this the Basilica Porcia could not have been far off, for when it was burned the Curia was consumed, and the fire must have reached the Comitium, for the base of the statue of Attus Nævius was injured.

Now, Canina has arranged all these buildings on the *south side*. He considers the Comitium to have extended along nearly all that side of the Forum, above this was the Curia, in front of which was the Grecostasis, and the Area of Vulcan; above these again, the Basilica Portia, the Temple of Concord of L. Opimius, and the Area of Concord. All these, as you will see, fall into their proper places extremely well. But his opponents place them on the *north side*, and they justify themselves chiefly by two very curious passages in Pliny. The first relates to the method of finding and proclaiming noon-day at Rome, which was done to give uniformity of time to the city, there being no clocks, and probably was looked to just as at present we look to see the ball dropped by means of the electric telegraph. He says, it was done "when from the Curia the sun was seen between the Rostra and the Grecostasis." Therefore, say both the Germans and Mr. Dyer, the Curia must have stood on the north side of the Forum so as to face the south, or the sun would not be seen at noon-day. The next passage is also in the Natural History of Pliny, that a lotos said to have been originally planted by Romulus, and cöeval with the city itself, and which stood on the Vulcanal, had extended its roots and penetrated through the Stationes Municipiorum (or sentry boxes of the guards), "in forum usque Cæsaris," *i.e.* as they translate it into the Forum of Cæsar. If then, say they, the Vulcanal was were Canina has placed it, how could the roots run quite across the Forum to the opposite corner, or nearly half a quarter of a mile.

Another point of objection to Mr. Dyer's theory is, that he places the Comitium upon the Forum itself, making it in fact part of the Forum. In more than one passage of Livy, he says, relating his prodigies in the usual way "*in foro et comitio sanguinis guttæ*, &c." It rained blood in the Forum and in the Comitium. He would hardly have used this expression had one been part of another. But there seems to be one simple fact utterly destructive of Mr. Dyer's views, and that is that the area of Vulcan is placed in the fourth region, and not in the eighth, or, as we might say, in Bishopgate Ward instead of Broad Street Ward. There can be no mistake about it; the Notitia, the Curiosum Urbis, Publius Victor, and Sextus Rufus all agree, and if there be any reliance to be placed on their general testimony, Mr. Dyer's theory must fall to the ground at once. The plans of Becker and Bunsen are very similar, they both place the Comitium above the Forum at its East end, the chief difference being its length. They also place the Vulcanal and Curia on the North side. Bunsen puts the Rostra and Grecostasis on the Comitium; Becker places the latter on the North side. There are several minor differences which we will not now stop to inquire into. The chief objections however to the plan of Bunsen, which in other respects is very ingenious, is the situation of the Via Sacra, which he places on the North side, and makes it pass close in front of the Temple of Antoninus and Faustina (Becker makes it turn abruptly there at a right angle). Now it is impossible that it could have passed in front of the temple, for even so late as the days of Palladio there was before the temple a large enclosed court, atrium, or τεμενος, which extended across nearly to the other side of the Forum. Palladio took careful plans of it, which he has published with all the details; no one surely would have ever ventured to block up the sacred way or to divert it, and this must have been the case if Bunsen's plan is right—besides it would have rendered the arch of Fabius useless, which was not the case; for we know from a passage in Trebellius Pollio, speaking of a statue of Saloninus, that it was "at the foot of the mountain of Romulus (the Palatine), that is (he says) before the sacred way, between the Temple of Faustina, and turned towards the arch of Fabius." Quite as unlikely also is it that

there should be two abrupt turns in the sacred way, and those made to avoid the two most sacred temples, the Vesta, and the Castor and Pollux; the more especially as the scholiast in Cicero speaks of those going in the sacred way "*post templum Castoris.*"

Let us now return to the objections made to Canina's views which were stated before, but left for future examination. First, as to observing the sun between the Rostra and Grecostasis from the Curia. Surely Becker could never imagine that his plan satisfies this condition? There is an angle of at least 60 deg. from the steps of his Curia between his Rostra and Grecostasis. It is less, it is true, in Bunsen's plan, but in neither plan, as I believe, could any eye mark the time of noon to half an hour. Now Canina's idea is, that the observer stood on the steps of the Curia with his back to the sun, and observed when the shadow of some object arrived at a line exactly midway between each, and he justifies this by the very same passage in Pliny, only reading the very next sentence, which shows how they marked the hour of sunset—namely, when the shadow thrown by the column of Mænius fell on the prison. If this view be correct, the Curia must have been on the South side facing the North, or the shadow could not have been seen at all. It must of course have fallen behind the temple behind the back of the observer. But a still more complete answer may be given as to the plant whose roots ran to the Forum of Cæsar. I think it is an error in the translation; "radices ejus in forum usque Cæsaris—per stationes municipiorum penetrant"—must be rendered "its roots penetrate into the forum as far as Cæsar's"—[what? clearly] Cæsar's Temple, the Temple of Julius, which, we shall shew presently, stood in the middle of the top of the Forum looking direct at the Tabularium. It is the same phrase as "habitabat Rex ad Jovis Statoris" of Livy, or the "limina post pacis" of Martial.

To be Continued.

ON FURNITURE, ITS HISTORY, AND MANUFACTURE.

By J. G. Crace, Esq., Contributing Visitor.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, March 23rd, 1857.

When a nation has made a certain progress in the arts it naturally seeks to adorn the ordinary articles of daily use, and to render them more convenient and elegant; so that out of a state of rude deformity they at last become objects of beauty and luxury—thus from a rude clay cup have been developed the precious vases of Etruria—and thus did refinement mark its growth on the bronze implements of Herculaneum and Pompeii.

Of the furniture of ancient times we possess but few specimens. We are told by Wilkinson that the Egyptians displayed considerable taste in the furniture of their houses; studiously avoiding too much regularity, they preferred variety both in the arrangement of the rooms and in the character of the furniture. Their mode of sitting on chairs resembled that of modern Europeans rather than of Asiatics; nor did they recline at meals like the Romans, though couches and ottomans were to be found in an Egyptian as they are in an English drawing-room. Many of the fauteuils were made of most elegant forms in ebony and other rare woods, inlaid with ivory. The legs were mostly in imitation of those of animals, but some had folding legs like our camp stools. The back was light and strong, consisting of a single set of upright and cross bars, or of a frame receding gradually and terminating in a graceful curve, supported from without by perpendicular bars. Over this was thrown a handsome pillow of coloured cotton, painted leather, or gold and silver tissue. The couches evinced no less taste than the fauteuils, and were of wood, with one end raised and receding in a graceful curve. The British Museum contains examples of chairs in ebony inlaid with ivory, of a kind of citron wood inlaid with dark wood and ivory, and an X chair likewise inlaid; all of which show the degree of perfection to which the Egyptians had attained. These inlays are made by veneering just as at the present day.

The paintings on the Etruscan vases supply us with numerous examples of the furniture used by the Greeks, showing with what elegance and simplicity of form they were designed. Judging from the tasteful folds of their garments and the pure ornamentation that enriched them, we may suppose that the furnished interior of a Greek house harmonized with the cultivated taste which fostered and applauded the works of Phidias and Apelles. The sketches, traced from examples on these vases, represent chairs which have served as models at the present day. The late Mr. Rogers had a set made from a bronze example in his own possession, but which is now in the British Museum.

Of the furniture of the ancient Romans we are enabled to speak with more certainty, as we possess a greater number of specimens, which the discovery of Herculaneum and Pompeii has brought to light. Less tasteful but more luxurious than the Greeks, their furniture was remarkable for richness rather than for purity of design. They had furniture in bronze and iron, and in precious woods inlaid with ivory and pearl; they had costly and beautiful stuffs richly embroidered with elegant designs; and their houses were decorated with such taste, that the remains taken from these two provincial towns excite the admiration of the most cultivated minds.

A passage in the 16th Book of Pliny's Natural History gives the following interesting illustration of our subject.

"The best woods for cutting into layers and employing as a veneer for covering others, are the citrus, the terebinth, the different varieties of the maple, the box, the holly, the holm oak, the root of

the elder, and the poplar. The elder furnishes also, as already stated, a kind of tuberosity which is cut into layers like those of the citrus and the maple. In all the other trees the tuberosities are of no value whatever. It is the central part of trees that is most variegated, and the nearer we approach to the root the smaller are the spots and the more wavy. It was in this appearance that originated that requirement of luxury which displays itself in covering one tree with another, and bestowing upon the more common woods a bark of higher price. In order to make a single tree sell many times over, laminæ of veneer have been devised; but that was not thought sufficient—the horns of animals must next be stained of different colours, and their teeth cut into sections, in order to decorate wood with ivory, and, at a later period, to veneer it all over. Then, after all this, man must go and seek his materials in the sea as well! For this purpose he has learned to cut tortoise-shell into sections; and of late, in the reign of Nero, there was a monstrous invention devised of destroying its natural appearance by paint, and making it sell at a still higher price by a successful imitation of wood."

"It is in this way that the value of our couches is so greatly enhanced; it is in this way, too, that they bid the rich lustre of the terebinth to be outdone, a mock citrus to be made that shall be more valuable than the real one, and the grain of the maple to be feigned. At one time luxury was not content with wood, at the present day it sets us on buying tortoise-shell in the guise of wood."

In the 13th Book Pliny speaks of the mania for fine tables. He says "There is preserved to the present day a table which belonged to M. Cicero, and for which, notwithstanding his comparatively moderate means, he gave no less than one million sesterces (£9,000). Two tables were also sold by auction which had belonged to King Juba, the price fetched by one was one million two hundred thousand sesterces." A library discovered in a ruined villa near Portici was adorned with presses inlaid with different sorts of woods. The beds were often made of cedrate enriched with inlaid work, &c., and a bed made of iron has been found at Pompeii.

In all these specimens of Egyptian, Grecian and Roman workmanship, it will be noticed that though the peculiarities of the style are distinctly preserved, they have no architectural character, but simply constructive forms and beauty of outline adapted to the material used.

We have now to pass through a dark cloud which obscured every phase of art; we pass over a period of more than a thousand years. According to Greek manuscripts of the tenth century, the decoration of furniture in the Eastern Empire must have been of considerable richness, as the thrones, seats, and beds represented, though rude and ungraceful in form, are highly decorated with gilding and inlaid work. Theophilus the Monk, in the twelfth century, tells us that, not satisfied with decorating the smooth parts of furniture with colour, they painted on it figures, animals, and foliage, sometimes on a gold ground. The same writer in his Essay on Various Arts, chap. xvii, thus describes the manner of preparing panels for painting on: "You must join the boards with care, piece by piece, by the help of the instrument used by carpenters and joiners, you must fasten them with glue; the panels brought together by this glue, when they are dry, adhere so solidly that they cannot be separated either by damp or heat. They must then be made smooth with an iron proper for that purpose; this iron, curved and cutting on the inside, is provided with two handles in order that it may be used with two hands. It serves to plane the panels and the doors so that these objects become perfectly smooth. You must then cover them with the hide, not yet tanned, either of horse, ass, or ox. After having macerated it in water and scraped off the hair, the excess of water is pressed out of it. It is applied to the wood in this damp state with the glue of cheese." In another chapter he explains the manner of covering these panels, lined with leather, with a light coat of plaster or chalk; he takes care to recommend the use of linen cloth or canvass if no skin is to be had; he afterwards gives the process of painting these panels in red or any other colour with linseed oil, and covering them with varnish.

The beautiful altar frontal in Westminster Abbey is a most interesting example of the process described by Theophilus, and it is of a period not far removed from his time.

We now enter upon a style of art founded upon principles altogether different from those which preceded it—the Mediæval. In that chivalrous era the tournament and the battle field were the predominating objects which engaged the attention of the many, and the study of literature and the practice of art were confined to the Church alone. The Crusades had, however, opened to Europeans a knowledge of the arts that still flourished in the East, and had probably material influence on the principles of Mediæval design. Our forefathers of the thirteenth, fourteenth, and fifteenth centuries, lived in a rude convivial manner which demanded few luxuries of furniture, and these at the earlier parts of that period were sufficiently plain and simple in form, depending rather on their painted decoration than on neat workmanship or carving; this taste, however, towards the end of the fourteenth century gradually changed, and colour gave way to more finished workmanship, moulded panels, and carved ornaments. The construction of the furniture thus became better suited to the material employed. On rejecting the covering of parchment, it was necessary to arrange the wood in smaller compartments to prevent it splitting or casting; hence arose the system of panelling and framing, which became the main feature. One of the chief beauties, however, of the furniture of this later time was the elegant metal work applied in the form of locks, hinges, handles, &c. Many of these still remaining show wonderful perfection and taste in the workmanship. I will not attempt to particularize the peculiarities of style of the various periods, but I will now describe the principal articles of furniture belonging to a house of that time. The great dining hall had a long table at the end, at which the lord and his principal guests sat; two other tables for inferior visitors and retainers were placed along the sides of the hall at right angles with the upper one; tables so placed were said to stand banquet-wise. The lord's seat was distinguished by a canopy, or "cloth of estate," on which was generally displayed his coat of arms, and a cloth of tapestry was hung against the wall. This end of the hall being raised above the rest was called the "high dese" or dais; the step forming a line of demarcation beyond which none were to approach except by invitation. Sometimes the tables were arranged in one length, in which case the salt cellar formed the boundary between inferiors and the more honoured guests. The floor was generally strewed with rushes. The tables were massive boards fixed on trestles morticed into the floor. The seats were mostly forms, but chairs were sometimes used. A MS. of the fourteenth century has this item:—"To put wainscote above the dais in the king's hall, and to make a fine large and well sculptured chair." At the further end of the hall a cupboard called the "Court cupboard" was generally placed, in which the service of plate, such as salvers and gold drinking cups, was arranged on shelves or stages, answering in some respects to the sideboards of the present day. These cupboards, though originally of rude construction, afterwards became elaborate and beautiful pieces of furniture richly carved in oak; they are often alluded to in old documents. On grand occasions temporary stages as cupboards were also erected. At the marriage of Prince Arthur, son of Henry VII, in the hall was a triangular cupboard, five stages high, set with plate valued at £1,200. entirely ornamental; and in the "utter chamber," where the princess dined, was another cupboard "set with gold plate, garnished with stone and pearl, valued at £20,000."

In the inventory of Skipton Castle, in Yorkshire, the furniture of the great hall is thus given—"Imprimis, 7 large pieces of hangings, with the Earl's arms at large in every one of them, and powdered with the several coates of the house. 3 long tables on standard frames, 6 long forms, 1 short ditto, 1 Court cupboard, 1 fayre brass lantern, 1 iron cradle with wheels for charcoal, 1 almes tubb, 20 long pikes."

The great chamber was often used as a sleeping room by night and a reception room by day.

Shaw, in his decorations of the Middle Ages, gives the interior of a chamber in which Isabella of Bavaria receives from Christine of Pisa her volume of Poems. The Queen is seated on a couch covered with stuff of red and gold, and there is a bed in the room furnished with the same material, to which are attached three shields of arms. The walls of the chamber were either hung with tapestry, or painted with historical subjects. Chaucer in his Dream fancies himself in a chamber—

"Full well depainted,
And al the walles with colors fine,
Were painted to the texte and glose,
And all the Romaunte of the Rose."

The floors, which at an early period were laid with rushes, were at a later one covered with a carpet of English or Turkey work. The description of the furniture in the great chamber at Hengrave, the seat of Sir Robert Kytson, temp. Henry VII, enumerates very minutely the various articles; among which are, a long carpet, tables with several coverings, cupboards, chairs, stools, two great chairs, silk and velvet coverings, cushions, curtains to the windows and doors, a great screen, fire irons, branches for lights, &c.*

There is no mention of a mirror, but they were used at this time, though very small, and were of metal polished. The coffer or chest which contained the lady's trousseau, was subsequently much ornamented. The wardrobes, so called, were generally small rooms fitted with cupboards called armaries. In 1253, "the Sheriff of Southampton was ordered to make in the King's upper wardrobe, in Winchester Castle, where the King's cloths were deposited, two cupboards or armariola,† one on each side of fire-place, with arches and a certain partition of board across the same wardrobe.

There were also tables of cyprus and other rare woods, carved cabinets, desks, chess-boards, and above all the bed — the most important piece of furniture in the house, of which Ralph, Lord Basset said, "Whoever shall first bear my surname and arms, according to my will, shall have my great bed for life." There was the "standing bed," and the "truckle bed;" on the former lay the lord and on the latter his attendant. In the day-time the truckle bed, on castors, was rolled under the standing bed. The posts, head-boards, and canopies or spervers of bedsteads, were sometimes carved, or painted in colours; but they are generally represented covered by rich hangings. King Edward III. bequeathed to his heir "an entire bed marked with the arms of France and England;" and Richard, Earl of Arundel, to his wife Philippa, "a blue bed, marked with his arms, and the arms of his late wife;" to his son Richard, "a standing bed, called clove, also a bed of silk embroidered with the arms of Arundel and Warren;" to his son Thomas, "his blue bed of silk embroidered with griffins, &c., &c."

The chair was a single seat without arms. The fauldstuel (fauteuil in modern French), was originally a folding stool of the curule form, but afterwards the form alone was preserved; examples remain from the time of Dagobert to a late period. Dagobert's Seat is considered by some to be of much greater antiquity than his time, and the back and arms are certainly of a later period than the rest. The so-called Glastonbury Chair is much to be commended for simplicity of form, perfect strength, and adaptation for comfort. In the earlier times chairs and benches were not stuffed, but had cushions to sit upon, and cloths spread over them; afterwards, as the workmanship improved, they were stuffed and covered with tapestry, leather, or velvet. The forms and workmanship of these seats were generally very rude, but the stuffs that covered them were of great richness and value, and tastefully trimmed with fringes and gimps, fastened with large brass studs or nails.

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* Vide Hunt's Tudor Architecture; a work from which many of these details of Mediæval Furniture are extracted.

† *Fr:* Armoire.

We now arrive at a period when the taste for classic literature led to the study of the arts associated with it, and produced the style of the Renaissance. Then appeared those great artist minds, Raphael and Michael Angelo; while the demand for articles of luxury called forth the genius of Cellini, Palissy, Jean Goujon and Germain Pilon. I think it is generally agreed that the Italians were the first to apply themselves to the manufacture of ornamental furniture of the more modern style. They adopted in their cabinets architectural forms, which they enriched with a superabundance of ornament, figures, inlaid marbles, &c., but so elegantly disposed as to make us forget the want of constructional character. Giuliano, son of Baccio d'Agnolo and his brothers Filippino and Domenico, are particularly mentioned by Vasari as the most talented sculptors of furniture in the middle of the sixteenth century. Marquetry was revived and applied to the decoration of furniture. Vasari names among the most skilful in this art in the fifteenth century Giuliano da Maiano (1460), Giusto and Minore who assisted him, and Benedetto da Maiano who excelled in the process of conjoining woods tinted of various colours, and thus representing buildings in perspective, foliage, &c. In the sixteenth century he mentions Fra Giovanni da Verona (who had a high reputation), Fra Raffaelle da Brescia, and others. This furniture was highly esteemed throughout Europe, and Vasari relates that Benedetto da Maiano made two magnificent coffers in marquetry for Matthias Corvinus, King of Hungary, but on taking them to him, he was distracted at finding, on unpacking them, that the damp weather had softened the glue, and that all his beautiful marquetry was detached from the work.

The large trousseaux chests, or coffers, of this period are remarkable for the richness and excellence of their sculpture; they were made principally for marriage gifts, and the talent of the first artists was employed upon them. The design of the work can scarcely be considered appropriate, as it bears characteristics suitable for stone rather than wood.

In the latter part of the XVIth century, the Germans had arrived at considerable renown for excellence in the manufacture of furniture—both in carved work and marquetry. More especially celebrated were those art cabinets (kunst schränke), of which many are still preserved in European palaces and collections. Adopting generally the design of an architectural façade, they combined in them all that was rich in materials and excellent in art—ebony, ivory, tortoiseshell, amber, lapis lazuli, jasper, and even gems were used by the painter, the goldsmith, the sculptor, the enameller, the workers in marquetry and mosaic, to produce conjointly these truly named art cabinets. The manufacture was principally carried on at Nuremberg, Dresden, and Augsburg. There is a fine specimen in the Green Vault at Dresden, which bears the name of Hans Schuferstein of Dresden; a desk which accompanies it is dated 1568; another cabinet in the same collection bears the name of Kellerthaler, a goldsmith of Nuremberg, and is dated 1585. One of the choicest examples is to be seen in the Royal Palace at Berlin; it was made at Augsburg in 1616, for the Duke of Pomerania, having been designed by Philip Hainhoff, and executed by Baumgärtner. Hans Schwanhard, another eminent cabinet maker, who died 1621, invented the undulating ebony mouldings introduced in cabinets of that time.

In France, through the efforts of Francis I. the arts made great progress in the XVIth century. He induced many celebrated Italian artists, as Primaticcio, Giulio Romano, Benvenuto Cellini, and many others, to settle in France, and laid the foundation of that taste which has since taken such deep root. Less celebrated than the Italian, French cabinet work yet arrived during the XVIth century at great perfection. Bachelier, a celebrated architect and sculptor of Toulouse, said to be a pupil of Michael Angelo, applied himself to cabinet work, and acquired great reputation. A cabinet in the Soulages Collection is said to be by this artist. The celebrated wood sculptor, Jean Goujon, disdained not to apply his talent to this branch of art. Marquetry also was much

employed by the French at this time. I have alluded hitherto to the artistic furniture of the period which was required for ornament rather than use, and could be purchased only by the very wealthy. The commoner articles of house furniture were still of a rude and simple character—good tools and clever workmen being scarce. The chairs were generally of the ordinary curule shape, of which there are several specimens in the Soulages Collection, some being of simple wood, others inlaid; there were also square chairs, with square stuffed backs—all rather rude in make, but sometimes covered with extremely rich stuffs, handsomely trimmed with fringes, &c.

Towards the end of the sixteenth century the Renaissance lost its earlier tastefulness, and especially in Flanders, assumed a bolder but coarser character. The furniture was picturesque, but had lost the qualities of purity of design. The chairs were much altered in form, the legs were turned, either plainly or spirally, the backs sometimes high and richly carved: as furniture of a showy kind was more generally used, the carving became of a coarser and commoner description.

The reign of Louis the Fourteenth of France introduced considerable alterations in the arts—richness and grandeur took the place of the purer style of the Renaissance. For the palaces built by Mansart, where Le Notre designed the gardens, and Le Brun decorated, it was necessary to have furniture to correspond with the splendour of all around. It was at this time that the celebrated Buhl or Boule was employed to make the cabinets that still bear his name. André Charles Boule, was born at Paris in 1642. His first ambition was to become a painter, but he at last settled to the business of his father, a cabinet maker, and the superiority of his works attracted the favour of the King, who granted him apartments at the Louvre, and named him "Premier Ebéniste de sa Maison." He then commenced the grand series of cabinets and other furniture for the palaces of the King and his courtiers: what particularly distinguished these, was the kind of marquetry in tortoiseshell and metal which was invented by Boule, and is still called after him. Although out of the bounds of strict taste, there is yet abundant genius in the works of this master. The patterns of his inlay work are full of fancy and beautiful drawing, and his gilt metal mountings, though detached and apparently unconnected, form a magnificent and harmonious whole. His grand inkstands and incidental furniture show wonderful talent in their flowing curves and harmonious ornaments. The genius of Boule is best understood by comparing him with his successors. Notwithstanding the richness, there is a sobriety in the ornamentation of his works, while in Crescent and others of his imitators, there is too much disposition to profusion of ornament. Another man of great talent in designing furniture and ornaments for inlay work, was Berain, who was also attached to the Royal factory.

During the reign of Louis XIV. the arts were much encouraged; his minister, Colbert, saw their importance, and though a Chancellor of the Exchequer, he was bountiful in founding schools for the instruction of workmen in drawing and knowledge of art, and in fostering that school of manufacturing art, the tapestry works of the Gobelins; this and the royal manufactory of porcelain at Sevres, in executing works of the highest artistic perfection, raised up a class of skilled designers and art workmen, who disseminated the knowledge they had acquired in these royal factories. Under Louis XV. furniture lost its grandiose character and became more remarkable for prettiness; the forms rounded or curved became more eccentric; the ornaments assumed the peculiar style called Rococo, which is founded on a system of reversed scrolls and shell-work producing undulating forms, not ungraceful in the hand of a master, but of dangerous facility of execution, and the curse of the common ornamental furniture of the present day. A taste for marquetry in woods was revived, and to such an extent was it used, that it sometimes covered the whole of a piece of furniture. The chairs of this time were very gracefully formed in the style called the Cabriole, in which there is no fixed form but continuous curved lines. As ease and luxurious comfort were

essential considerations, the upholsterer's art of stuffing became an important aid in carrying out these desiderata. Beauvais tapestry of a very beautiful description, representing flowers, animals, trophies, or pastoral subjects, was also applied to furniture.

In the time of Louis XVI. a fresh style of ornamentation arose, which is now known by that monarch's name. It resembled the Renaissance in its ornaments, but had nothing of its artistic genius; and it mingled delicate foliage and ribbons and roses with the attributes of Corydon and Phillis. The furniture of this period is remarkable for the elaborate finish of the ornaments, the constructive forms being simple and generally without curves. Marquetry work in France appears to have reached its perfection of finish at this time. Reisner, David Reintientz, a native of Neuwied, and Gouthier, were eminent cabinet makers, and celebrated for this kind of work. Reisner was remarkable for his peculiar and beautiful inlay of flowers, the leaves of which were shaded by heat. David Reintientz produced the shades of his marquetry solely by the natural colours of the woods; nothing can exceed the extremely fine jointing of the parts of the marquetry by these two masters, nor the taste and perfect finish with which the various woods are combined. Gouthier was celebrated for the exquisite taste and elegance of his metal works, producing groups of foliage and flowers which rivalled nature in the perfection of their design and workmanship; this artist was, I believe, the inventor of "or-mat" in metal work. David made the meuble de noce of Marie Antoinette, and Gouthier one for the Comte D'Artois on his marriage. The chairs and sofas of this period had lost the graceful curves of the former reign, and a stiff straight style was adopted, which was however relieved by the infinite delicacy of the ornamental carving.

The Revolution in France, especially during the reign of terror, must have either ruined or caused to wander abroad most of the art workmen, and for a long period a style of art obtained which was a very poor copy of the classic; this under Napoleon I. was modified into the so-called style of the Empire, founded on the works of Percier and Fontaine, two celebrated architects; but though any style carried out by clever men may have a certain merit, there is little in this to interest or instruct. The furniture of this period was made principally of mahogany, with little if any carving, the ornamentation being given by bronze work of a very flat and meagre character.

During the reign of Louis Philippe, French art changed very considerably, and sought for models in the Renaissance period. The periodical exhibitions of national products, by causing emulation among the manufacturers, produced a higher class of art workmen, and by the beauty of the works executed, caused a great demand for them. May these words of the celebrated Necker ever be borne in mind by our Chancellors of the Exchequer, "Le goût est le plus adroit de tous les commerces," which may be rendered thus—"That no kind of commerce has such skilfulness in increasing the demand for manufactures, as taste." The art of marquetry, which had lain dormant since the Revolution, was revived, and wood carving, as applied to art manufacture, arrived at a very high state of perfection.

In speaking of the furniture of various countries since the Renaissance I have not alluded to our own, but as England had not exhibited any peculiar excellence in this manufacture, I thought it better to carry on the explanation of the successive styles through those countries which particularly influenced them. While the Renaissance supplanted the Gothic in France, Italy and Germany, our own country adopted the Tudor style, till that was changed into a coarse kind of cinque cento work named the Elizabethan; this continued with various modifications till the works of our celebrated countryman Inigo Jones, induced a taste for Italian art. The carved oak furniture of the time of Elizabeth and James the First, is marked by rather exaggerated forms, particularly in the turning, as instanced in the bed of Ware and that from Cumner Place, illustrated in Richardson's work on Old

English Mansions. The tables and buffets too, where turned work is introduced, present the same features; the friezes and panellings have either scroll work or that particular kind of ornament called strap work; various specimens of furniture of this period and the next century remain at Penshurst, Knowle, Hardwicke Hall, and Holland House. Towards the time of King William and Queen Anne, the style greatly changed, assuming more of a bold Florentine character, but taste seems then to have declined till the time of George the 3rd, when I think it reached its lowest point—a compound of Strawberry Hill Gothic and Chinese being considered the most fashionable style. Mayhew and Ince, Cabinet Makers, published in 1750, a work of specimens in this style, and Chippendale, another manufacturer, and an able man, also published a collection of designs. It was a grand step to work away from these false ideas of ornaments, and resume a quiet simple style distinguished by good workmanship and pure taste; this was achieved by our cabinet makers early in this century. During the last forty years art has grown up gradually amongst us, until we perceive the full importance of encouraging it; above all, competition with foreign countries has taught us to know our own deficiencies.

I will now say a few words respecting the manufacture of furniture: it will not be possible to give a full description of the various details, but an account of some of the ornamental processes may be of interest.

It is essential for good cabinet work that the wood employed be thoroughly seasoned,—far more so than for joiners' work. Except in wainscoat furniture, almost all of it has, in some part or other, to be veneered; the handsomer qualities of wood being too expensive for use in the solid, and also not so likely to stand as when laid on a wood of a plainer kind. The ground generally used for this purpose is Honduras mahogany. Veneer is wood cut into sheets, about one-sixteenth of an inch thick, by saws contrived for that purpose. The wood from which these veneers are cut sometimes fetches an extraordinary price. The ornamental knotted-looking walnut wood, now so much used, is a burr of the tree, or a swelling, generally near the root. The woods most frequently used for veneering are, the fine kinds of mahogany, rosewood, satinwood, birds'-eye maple, walnut, tulip wood, and amboyna. The ground, having been prepared of the required form, is finished with a toothed plane on the side to be veneered, and the veener itself is also planed in the same way. The wood is first soaked with water, then the sheet of veneer is well dried, and afterwards both it and the ground are spread over rapidly with glue, and the two parts are brought immediately together; when joined, it is at once covered with a heated caul, either of wood or metal, and afterwards a number of screws are applied, so as to press the parts together in every direction.

Marquetry, or the inlay of various woods, is one of the most beautiful processes in cabinet work. The design, having been first drawn on paper and properly coloured, is pricked with a fine needle, so that the outline of the ornament can be pounced on the various coloured woods proposed to be employed. These outlines, being carefully marked in, are cut with a fine watch-spring saw. In most cases the wood forming the ground is cut with that of the ornament; so that a piece cut out of white wood corresponds exactly in shape and size with the opening left in the black wood, in which it therefore fits, and forms the required pattern. In those ornaments which are shaded, the effect is given by dipping them in heated sand. The various parts being cut out, of the required tints, are now adjusted according to the design, and fixed on paper; they are afterwards applied, exactly as veneer, to the piece of furniture. Buhl, or Boule, inlay is conducted on the same principles as marquetry, only the various ornaments are cut out of sheets of metal, tortoiseshell, or ebony.

I have shown that it was the policy of the French government, and still is, to encourage and develope a knowledge of art among their manufacturing population. And I acknowledge that much

has been done by our own, in the establishment of schools of design in various towns; but it is essential to bring before the eyes of art-workmen good examples; to form collections of the fine productions of former times; and thus not only to form schools of art for them alone, but to educate the popular taste, and thus create a demand for what is beautiful. With this feeling, I can scarcely believe that the Government have decided not to purchase the Soulages Collection.

Think of the Museums at the Hotel de Cluny and at the Louvre, at Paris, and compare them with our own! Compare also with our own the French exports of fancy goods, dependant upon taste —their furniture, their bronzes, their paper hangings, their printed muslins, their rich silks,—and then acknowledge, that as certainly as "*knowledge is power*," *taste is commerce.*

I will now hazard a few remarks upon the principles that should guide us in our designs for furniture. I will recite, if you will allow me, two sentences out of the report I was suddenly called upon to draw up on Furniture at our Exhibition of 1851.

"It is important, both for the strength and good effect of furniture, that the principles of sound construction be well carried out; that the construction be evident; and that, if carving or other ornament be introduced, it should be by decorating that construction itself, not by overloading it and disguising it. It is not necessary that an object be covered with ornament, or be extravagant in form, to obtain the element of beauty; articles of furniture are too often crowded with unnecessary embellishment, which, besides adding to their cost, interferes with their use, purpose, and convenience. The perfection of art manufacture consists in combining, with the greatest possible effect, the useful with the pleasing; and the execution of this can generally be most successfully carried out by adopting the simplest process."

Though these words are mine, the principles they enunciate are from a far higher source, and were published as early as 1841, by Augustus Welby Pugin—a man now, alas, lost to us—whose memory I revere, and whom I look up to as one of the greatest artists of his age—whose genius had scarcely begun to be known to the world, when he was struck down. He rarely mixed with society, and his high attainments and great powers of mind were therefore only fully known to the few who possessed his intimacy and his friendship. For some years previous to his death, I had the advantage of his advice and assistance in the Gothic furniture I made; and I have brought a few, out of the many of his designs I possess, to show to you.

I have lately heard it discussed whether Gothic furniture and decoration are suitable to a nobleman's house of the present day; and whether their forms and appliances are compatible with modern taste and comfort. In my opinion, there is no quality of lightness, elegance, richness or beauty, possessed by any other style, which cannot, with equal propriety, be maintained in Mediæval furnishing and decoration; and with this addition, that I know no style in which the principles of sound construction can be so well carried out.

Returning to the immediate subject of this paper, let us hope that the principles of true taste will guide us in improving our household furniture: it is as essential in the simple as in the more elaborate kinds. Let us avoid gross, exaggerated carvings, which, applied without meaning, only vulgarize everything they are intended to decorate. Neither let us imitate the French, in their exuberance of ornament. Let us feel that well-considered forms and proportions cost no more in their manufacture than distortions, and that utility and construction should be the element of design. To conclude, in the words of Pugin: "Let, then, the BEAUTIFUL and the TRUE be our watchword for future exertions."

The Chairman, T. L. Donaldson, H.S.F.C., after a few observations on the importance of furniture as an accessory to architecture, said, that whilst the Romans displayed considerable taste in some of their articles of furniture, it was remarkable that they had no carpets whatever, and that their mural decorations consisted of paintings; carpets and tapestry hangings were introduced from the eastern nations. The Greeks and Romans paved their floors with tesseræ in a great variety of patterns, amongst which the fret was the most frequent. Vitruvius mentioned an instance where the remains of a feast was represented by the tesseræ of the floor. Considerable magnificence was displayed in the furniture of Mediæval times, and as an interesting specimen, the Throne or Coronation Chair in Westminster Abbey might be referred to. This had been originally a magnificent piece of furniture, the wood being richly carved, and partially covered with a kind of stucco gilt. The other chair was a rude imitation of this in the very worst style. With regard to marquetry he considered it had originated in the art of inlaying in marble. This art, of which such remarkable examples were presented in the Cathedral of Florence and Giotto's Tower, appeared to have preceded that of inlaying in wood. Mr. Crace had ably illustrated the beauty of the marquetry of the age of Louis XIV; and, as he had observed, the furniture of the time of Louis XVI. became very much debased until, under Napoleon I., nothing could be more paltry than the taste displayed. The French, however, had resumed a better style of ornament, but it was to be feared that they were in the habit of carrying decoration to excess in furniture, as well as in architecture. The beautiful works of Fourdinois in the Exhibition of 1851, and the specimens of furniture exhibited in Paris in 1855, displayed very great merit. At the same time, as Mr. Digby Wyatt had shewn in his resumé of the last mentioned Exhibition, many in our own capital had produced works of considerable taste. To bring furniture to artistic perfection it was only necessary to uphold the cultivation of taste, and he could not but regret the miserable spirit of economy which stood in the way of the advancement of art, and was in fact a dishonour to the nation.

Mr. Scoles, Fellow, having observed that in the period of 1000 years, which Mr. Crace had passed over—from the Classical to the Mediæval times—the Byzantine period had intervened; and that this might have afforded some interesting illustrations; Mr. Crace said, that in alluding to the works of the tenth century, he had in his mind the Greek Manuscripts and other works of the Byzantine era, although he had not specially referred to them. He might remind the meeting that on a former occasion he had read a paper on Paper Hangings, in which he had given some history of Tapestry and other wall hangings, and he had therefore not thought it necessary to repeat his remarks on this occasion.

Mr. M. D. Wyatt, Hon. Sec., remarked that the ivory dyptichs presented an interesting series of examples of the seats of the Emperors of the East, from the time of Constantine, for two or three centuries. These seats, as well as the dresses of the Emperors were, in course of time, covered with jewels. The Great Seals of England and other countries also afforded illustrations of furniture, as the Sovereign was generally represented as sitting in state, and the cushions, with the arms and back of the throne were displayed. These seals were the work of the best artists of the time, and therefore illustrated the most advanced style of art in furniture.

Mr. Crace exhibited to the meeting specimens of marquetry which had been cut during the proceedings by one of Mr. Blake's workmen, and described the process and its results.

Mr. C. H. Smith, Hon. Mem., made a few remarks on the beauty of the mode of workmanship and the extreme accuracy with which the parts could be fitted together. He stated that supposing the work to consist of two alternate layers of brass and tortoiseshell, two patterns would be made, the

one of brass inlaid in tortoiseshell, and the other *vice versâ*. If the pattern was carefully drawn, and the workman thoroughly skilled in his art, the result far surpassed anything that could be produced by other mechanical means.

Mr. M. D. Wyatt observed that in the establishment of M. Cremer, at Paris, the patterns for marquetry were printed in lithography, which had been found to do away with the errors incidental to the process of pouncing.

Mr. Crace agreed that this was a very ingenious and useful application of lithography. The paper however on which the designs were thus printed was liable to shrink unequally, whereas the greatest precision and accuracy was necessary in designs for marqueterie.

Mr. C. C. Nelson, Hon. Sec., drew attention to the subject of parquetry for floors. He had seen some parquetry employed by Herr Laves, the Court Architect at Hanover in 1836, at a very small expence; but he had been told that the parquetted floors of Buckingham Palace, executed under the directions of Mr. Nash, had cost something like £200. per square, including the rough main floor, one of wainscot, and the parquetry work upon it.

Mr. Crace said that instead of £2. per foot, the price of parquetry for floors was now more like £2. per square metre. In parquetry the ground formed an important feature. A very ingenious mode of forming this ground was by a series of cross bearers, one over another, leaving an open space between them, so that the shrinking one way should be counterbalanced by the shrinking the contrary way. The design itself was then cut out in far greater thicknesses than for marquetry, and, as a more perfect vertical position of the saw was required than could be obtained by any hand work, a machine or tool acting with a treadle was employed.

Mr. Roberts, Fellow, having alluded to Florentine Mosaic work as somewhat analogous to the subject under discussion, the Chairman observed that the specimens of Florentine Mosaic exhibited in 1855 did not sustain the reputation of that manufacture, whilst some of the Indian specimens were remarkable for the beauty of the inlay of hard marble.

Mr. M. D. Wyatt mentioned the inlaid table tops from Agra and Delhi exhibited in 1851. The jury on that occasion could not believe that not only the leaves and the petals of the flowers, but also the thin dark lines connecting them, were inlaid. It was thought that these lines were filled in with some sort of mastic, but it was found that in fact these lines were actually filled in with hard stone, worked on a lathe and cut with diamond dust or some other powerful abrasive powder. With regard to Florentine Mosaic, the materials employed were so valuable that it was impossible to execute them like marquetry. The separate pieces were each cut on the wheel, in the most careful way, polished like gems, and then fitted to the corresponding pieces.

Mr. Baker, Associate, inquired the kind of cement employed in marquetry, as it appeared a matter of importance, from the delicacy of the work, and the risk it might be exposed to from damp or heat.

Mr. Crace said that ordinary glue was generally employed, and that gelatine was sometimes, but very rarely, used with satinwood and other light coloured woods, in order to prevent staining. He saw no reason however why marine glue should not be employed.

Mr. M. D. Wyatt suggested that Mr. Crace might explain the process used in the production of the coarse tables and mosaics, the pattern of which was produced by the repetition of certain geometric forms.

Mr. Crace said that the manufacture referred to was precisely similar to that which was carried on to a great extent at Tunbridge. The well-known "Tunbridge ware" was produced by layers of

wood brought together longitudinally side by side, and cut into transverse sections. Although troublesome in the first instance this process was very economical, because, if the forms were well disposed, a slip of a couple of feet in length might be cut into an innumerable quantity of mosaic patterns.

Mr. M. D. Wyatt suggested that this process might account for the facility with which the Queen of Spain's table (exhibited in 1851) was constructed. It was said that that table comprised something like 3,486,000 separate pieces of wood.

On the motion of the Chairman, thanks were voted to Mr. Cracc, and the meeting adjourned.

Vincent Brooks

ON THE DIFFERENT THEORIES RESPECTING THE FORUM AT ROME, PARTICULARLY THOSE OF OUR LATE MEMBER THE COMMENDATORE CANINA.

By Arthur Ashpitel, Fellow, F.S.A.

Portion of the Continuation read at the Ordinary General Meeting of the Royal Institute of British Architects, April 20th, 1857.

Among the alterations immediately preceding the Imperial period, the first to be noticed took place in the Curia or Senate House, which, as has been related, was burnt at the funeral of Clodius. The mob infuriated at the loss of their leader, rushed to the Curia, tore up the benches and tables, seized the books and papers, and made a funeral pyre on which they burnt his body. The flames caught the Curia and destroyed it, together with the Basilica Porcia. This we learn from Dion Cassius and from the Commentary of Asconius on Cicero's famous speech in defence of Milo. The account of the former author is clear and circumstantial, and though it has been alluded to, strange to say, it never seems to have been accurately quoted. He states (lib. 40, page 144), that it was ordered that Faustus Sylla, the son of the Dictator, should rebuild the Curia; this he says was the Curia Hostilia, and that Faustus altered it somewhat during the building, and gave it his own name. If we turn to the 44th book, page 242, we find that in Cæsar's time, during the first triumvirate, Sylla's work was pulled down under the pretence of laying the foundation of a temple to Felicity, by Lepidus, when Master of the Horse; but, in reality, to get rid of the name of Sylla, and to build a new Curia to be called the Curia Julia. Turning to the 51st book (page 459), we find it stated of Augustus, "Then he performed these things, he dedicated the Αθηναιον (which may be translated Temple, Ædes or Atrium of Minerva), that which is called the Chalcidicum; and the Curia Julia which he had made in honour of his father." Again, under the works of Augustus, recorded in the Monumentum Ancyranum, it is stated that he built CURIAM ET EI CONTINENS CHALCIDICVM, a Curia, *and joining it* a Chalcidicum, or, as it is given by Gerhard, CURIAM CUM CHALCIDICO, a Curia *with* a Chalcidicum. There, our great authorities again differ, Becker is of opinion that the Curia Julia stood entirely on new ground. Canina's opinion is, that the new Curia stood on the site of the old (in this Mr. Dyer fully agrees with him); that it stood at the top of the Comitium, in which he is confirmed by Dion Cassius; that the Chalcidicum was a portico attached to this Curia, which seems to be clearly deducible from the Monumentum Ancyranum; and that a sort of Atrium, or entrance, attached to the Curia and within the Chalcidicum, was the Minervæum. In the absence of positive proof, the opinion of our late member really seems the most reasonable. Becker's idea that the new Curia could not have stood on the site of the old, has been shewn to be a misapprehension; and Bunsen's idea of a Minerva Chalcidica seems utterly groundless—as we read the inscriptions, a Curia Chalcidica might be tenable, because the names go together, but it seems quite begging the question, to suppose a Temple of Minerva Chalcidica, especially as such a building is not mentioned in any author or inscription, nor in any of the Regionaries.

It is strange to see the number of names that have been given to these three columns. For a long time they were called those of Jupiter Stator—but they cannot be, as that temple was close to, if not within the Palatine Gates. Poggio supposed them to be part of the Bridge of Caligula, though there is not the vestige of a bridge about them. Nardini considered them part of the Comitium, but

that it has been shewn was an open space, and only covered occasionally. Nibby calls them part of the Grecostasis—Becker and Mr. Dyer, the Temple of Castor and Pollux. If Canina is right in his views as to the Comitium (and I think I have shown he is); if the Curia Hostilia stood at the end of the Comitium as the authorities prove; and if the new Curia was built on the site of the old, as seems clear from Dion Cassius, there can be no doubt that Canina is right, and that the three noble Corinthian columns which tower over the Forum are rightly designated by him as those of the Curia Julia.

The next alteration in the Forum was the erection of the Temple of Julius Cæsar. It is clear from a passage in Ovid, that this temple was at the eastern end of the Forum looking directly to the Capitol. Bunsen supposes it to have been on the Velia—but the Fasti Ameritini distinctly say, "Divo Julio ad Forum."

The next important change was the erection, or rather completion of the Basilica Julia, the position of which has been clearly defined by an inscription found there. Canina has placed it on the site of the old Comitium, and this position seems to be probable, for the change of times which had made the Comitia Curiata of less importance than the Comitia Tributa, had rendered both utterly useless compared with the voice of a Dictator. It appears that Augustus in order to do honor to all his relatives, wished this to be called the Basilica of Caius and Lucius, but it seems to have always retained the name of Julia. It must have been a gigantic building, 200 feet wide by 400 feet long, and according to the account of the younger Pliny, it was the Westminster Hall of Rome. He speaks of seeing 180 judices or jurymen there at once, and of his resorting there from time to time to hear the proceedings. The excavation of the remains has now completely put an end to conjecture as to whether the Forum extended lengthwise from north to south, or from west to east. This vast building standing quite across the way has settled the question, and in spite of some ludicrous attempts recorded in the Classical Journal, when the steps of the Basilica were first exposed, no one possessing the slightest classical acumen now maintains the old theory of Nibby.

We should now proceed to the curious and interesting investigation of the three temples under the Tabularium—but the facts and arguments relating to them, and the illustrations drawn from the celebrated passage in Statius, describing the Horse of Domitian, were so ably laid before you a few years back by our excellent Honorary Member, the Rev. Richard Burgess,* that I will not now dilate upon them. We now come to the consideration of the Capitol itself—a subject which has lately awakened unusual interest. In addition to what had already been written, a very able critique has just appeared in a late number of the Quarterly, upon Mr. Dyer's opinions on the subject of the Capitol, contained in his excellent article on Rome in Dr. Smith's Dictionary of Classic Geography. The writer takes the side of Messrs. Becker and Bunsen against Mr. Dyer, who adopts the views of Canina and Dr. Braun.

The nature of the Mount, a sort of saddle-back with an intermediate hollow, has been before described, and it seems clear from the account of Varro, that the entire hill was as much designated "Capitolinus," as the other hills "Palatinus" and "Aventinus." But from the circumstance of there being two summits, a sort of subdivision seems to have been adopted, and however terms may have been interchanged, one summit seems especially to have been called "the Arx," and the other "the Capitol," the hollow ground between being designated the Intermontium. The great question now is, which was "the Arx," and which "the Capitol." Mr. Dyer and Canina place the Capitol on the northern summit and the Arx on the southern—The reviewer, following Bunsen and Becker, reverses this order. Two things are agreed on by all, viz:—that the Temple of Jupiter Maximus stood on the

* In his paper on the "Topography of the Roman Forum," read June 28, 1852.

Capitolium—and that of Juno Moneta, the Roman Mint, on the Arx, the spot where formerly was the house of Manlius. That the whole hill was called the Capitol, is clear from the fact, that it is always so named in the enumeration of the seven hills, just as the whole hill was formerly called the Tarpeian, and before that the Saturnian Mount. It took its name from the head of a man named Tolus (Caput Toli), being found fresh and bleeding under ground, while excavations were being made for the foundation (Jul. Obseq. 5). This event was considered such a prodigy as to justify the change of name. Now this was two centuries before the time of Romulus, and yet Livy (1. 10), describing his offering the Spolia Opima to Jupiter Feretrius, says, he ascended the Capitol, by which word, of course, the whole hill must be meant. When, however, classic authors speak of the hill alone without relation to the other hills, the Arx and the Capitol are mentioned separately; thus Livy describing the surprise of the place by Herdonius, of which we shall treat presently, says—"the news went to Tusculum that the Arx was taken and the Capitol seized upon;" in another place, "the Arx and the Capitol were in great danger;" in another, "the Arx and the Capitol, the dwelling-place of the Gods," and numerous similar examples might be quoted. But there is even something more, the whole hill was sometimes called the Arx. Thus, Servius in his Commentary on the Æneid, VIII, 652, says, "thus on the other part of the shield was modelled the Capitol because this is manifestly the Arx of the City." Mr. Dyer also cites a passage from Cicero (Ver: 2, 6), to the same effect.

Perhaps an example might be found among our own writers, when speaking of the Tower of London. It is often said such a one was sent to the Tower, tried and beheaded there, when in fact, the execution took place out of the Tower, upon the Tower Hill; and sometimes people are said to have been executed on Tower Hill, when in fact, they underwent their sentence on the rising ground called Tower Green, in front of the chapel and inside the tower walls. To doubt an English historian's accuracy because he might confound one spot with the other, would be too severe—and yet these are distinct spots, with a broad moat between them. Thus with respect to the Capitoline Mount, one summit should be called the Capitol, the other the Arx, the Intermontium between them: can we now define the right names for each division? Becker tries to settle the matter at once, by quoting from Livy, 35, 21, "A large stone, whether from the rains, or from a slight earthquake, having slipped, fell from the Capitol into the Vicus Jugarius and killed several people." Now we know this street began near the Temple of Ops, and passed close under the southern hill, but it has been shewn that the whole hill was called Capitolium, times without number, and therefore the passing expression proves nothing. He then quotes a passage from Suetonius, who, in relating the mad pranks of Caligula, says he built a bridge from the Palatine to the Capitol. If the Capitol had been on the northern summit, this bridge must have crossed the Forum at an angle, a thing highly improbable. But the fact is, we find on referring to the author, that the half-crazed, half-savage wretch, was seized with the desire of being adored by the people, and that he sometimes sat between the statues of Castor and Pollux in their temple inviting public worship, and at last pretended to receive frequent visits from Jupiter Capitolinus. "He then," says the author, "throwing across a bridge (ponte transmisso) over the Temple of Augustus, joined together the Palatine and the Capitol." There is not a word of the Arx, nor of *building* a Bridge. Not a word about the bridge in any other author, though such an erection a hundred feet high, and a quarter of a mile long must have been something to talk of. A bridge is said to be "transmissus," literally "sent across" not over an open space, but over the Temple of Augustus! Now, a little further, we read that another of his pranks was to scatter money from the roof of the Basilica Julia among the people; what then can be more easy and probable, than to suppose he had a light bridge, possibly moveable, thrown across from roof to roof of the temples, which would at last land

him in the Tabularium, whence he could ascend to the Arx or to the Capitol as he pleased? I is evident he was in the habit of passing over the various roofs—and if so, what need had he of such a stupendous, such a gigantic bridge, of which no remains exist, and of which no author makes mention?

There is another story, of which Becker makes a great deal, and which requires a little more consideration. It is the account of the sudden surprise of the Capitol by Appius Herdonius, a Sabine by nation. The account is partly given by Livy, and at greater length by Dionysius of Halicarnassus (10—14), The facts occurred a little before the time of the famous story of Virginia. Herdonius seems to have been a sort of adventurer, who had

> " Shark'd up a list of landless resolutes,
> For food and diet, to some enterprise
> That hath a stomach to it,"

in fact, he had collected as many exiles and slaves as made together a body of about 4000 persons. In justice to all parties let us take the account as given by Dionysius. He states, that Herdonius got his men together in some light boats, that " they crossed the Tiber at that part of Rome where the Capitol stands, which is scarcely a stadium (a little over 200 yards) from the river; then, it being the middle of the night, and all the city being deep in sleep, they went up at their will through the unlocked gates, for thus do the sacred gates of the Capitol remain through an oracle (they call them the Carmental gates); then, sending up their power, they seized the Φρουριον, or guard, then making an attack on the Arx (ακρας) they made themselves masters of it." Now, Becker reads the passage to mean that Herdonius came to the Carmental gates (not of the Capitol) but of the city itself; that he slipped through them, and then scaled the rock and entered the Arx, and thence the Capitol. But these difficulties directly suggest themselves; is it to be reasonably supposed a city would be carefully fortified with walls and gates, and yet the principal gate be always left open to the attack of an enemy? It can easily be understood why an inner gate should always be left open according to an oracle, especially when leading to a holy place like the Capitol; but an outer gate always open would be as useless as no gates or walls at all. But Dionysius does not say it was an outer gate; he says it was the gate of the Capitol, called the Carmental gate, and this it might well be. It was close to the Altar of Carmentis, and it has been shown that its name had varied; it was sometimes called the Saturnian gate, sometimes the Porta Pandana. In fact, there is a strong presumption that it never meant the Carmental gate of the city, and that is Herdonius brought his men by water. Now, if he passed the gate of the city by the river, landed his men within the city (which we can easily conceive), and then rushed upon the open gates of the Capitol, seized on the guard, and made himself master of the Arx and the Capitol, the whole affair is intelligible, and intelligible according to the notions of Canina. In fact, I must say these arguments of Becker's seem to me to prove nothing; and besides it is difficult to comprehend the account according to his views, and easy to understand it according to the ideas of Canina and Mr. Dyer.

But the great point made by the last writer on the subject, the Quarterly Reviewer, is based upon a well known passage of Tacitus, describing the attack on the Capitol by the soldiers of Vitellius. It was held by Sabinus, and the Vitellian soldiers seem to have attacked it in a hasty disorderly way, without any plan or leader. The passage in Tacitus may be thus translated:—" The furious solders approached with no general, every one his own leader; having gone round the Forum and the different temples, they attack the hill before them as far as the first gates of the Capitoline Arx. There were formerly porticos on the side of the clivus, on the right hand as you go up, from the roofs of which, going out, they overwhelmed the Vitellians with stones and tiles. These had no

weapons except their swords, and it seemed too long to wait for the engines of war and missiles. They threw torches on the projections of the porticos, and followed the flames, and would have penetrated the burnt doors of the Capitol, had not Sabinus flung in their way, torn down from all quarters the statues, the glory of our ancestors, and blocked up the way as with a wall. Then they attack the different accesses to the Capitol that are near the grove of the Asylum, and where the Tarpeian Rock is approached by the hundred steps. The attack at both points was unexpected, but that at the Asylum was the closest and sharpest; they could not be checked, clambering over the closely built houses, which, in a long peace, had been suffered to come as high as the ground of the Capitol. Here there is some doubt, whether the besiegers threw fire on the roofs, or whether the besieged (for this is the more common report) did so to check the advance of the enemy. Be this as it may, the fire glided along the porticos attached to the temples. The rafters supporting the pediment, being of old and dry wood, caught and supported the fire; and thus the Capitol, though the doors were closed, though it was not defended, nor was it taken, yet was it burnt down."

Before we go into the question with the Quarterly Reviewer, let us enquire where the Tarpeian Rock was. Though it has been shown that the whole mount was formerly called Tarpeius, yet one portion of it, in latter times especially, bore that name. It was the place of execution, whence great criminals were hurled headlong down. We know from Livy (6. 20), as we shall see presently, that it was here the Gauls scaled the rock, and hence Manlius was afterwards cast down, so that, as he observes, "the same place, the Tarpeian Rock, was a monument of his glory and of his last punishment." We also know from Livy (5. 47) this was close to the Altar of Carmentis. Becker, with his usual heat, and somewhat unhappily, supposes this spot to have been on the other side of the hill, overlooking the present city, close to the Tor degli Specchj; but he disregards the fact that this is not near the Altar of Carmentis; and still worse, that Dionysius of Halicarnassus, speaking of the execution of Spurius Cassius, expressly says it was "from the rock overhanging the Forum," (8. 75,) and he makes use of the same expression in the history of Caius Marcius (7. 35). The exact spot, is probably the cliff in the Gardens of the Società Archeologica, which is at present at least 70 feet in sheer perpendicular height. Now this, as has been seen from Tacitus, was approached by the hundred steps: among the Capitoline stones is one showing a long flight of steps leading to some very great height, with a temple near it. This Canina thinks to be the plan of the "Centum gradus," and it seems certain he is right, for a similar flight could not have formed the ascent to any other hill. The principal points relative to the Tarpeian Rock may thus, I think, be considered as settled.

Reverting, now, to the observation of the Quarterly Reviewer, we are startled at the outset by the statement, "The only access to the Capitol or the Arx was by the Clivus Capitolinus." Why, the very words of the author are, "Then they attack the different accesses, 'diversos accessos,' where the hundred steps are, and close by the grove of the Asylum." There must, therefore, have been at least three entrances, one from which they had been driven by Sabinus; that of the hundred steps; and another by the grove, and this probably was the one by the Gemonian Stairs, at the other end of the Tabularium; in fact, where the present access is. Then the Reviewer says, "they mounted to the first doors of the Capitoline Temple." Why, the very words of the author are, "the Capitoline Arx." He then goes on to say, "the Capitol would, of course, abound with statues, but we should not expect this of a bare fortification like the Arx." Now Tacitus is clearly speaking of nothing of the sort, he says there were porticos on the Clivus, and the defenders were on the roofs, and that the Vitellians, so far from being overwhelmed either from the Capitol or Arx, actually never even reached the first doors. Who can doubt that these were the gates of the Porta Pandana or Saturnia, or, as Dionysius would call them, the Porta Carmentalis? Then, says the

Quarterly Reviewer, they diverged into the Intermontium, and attacked it on that side. There is no proof they ever entered into the Intermontium at all. But perhaps the most extraordinary part is, that he next enlarges on the defensibility of temples in general, when Tacitus expressly tells us, "the Temple was neither defended nor taken, but was burnt more by accident than design." In fact, the idea of Canina is far more clear and consistent. He supposes the second attack to have been made on the other side of the Tabularium. There are now houses near this height, lofty enough from which to throw torches on to the Church of the Ara Celi, where Canina supposes the Temple to have stood, the mount at this point not being so steep as at the other summit, which is actually precipitous. It is stated that it was a sudden rush, and the defenders had not time to meet it, and perhaps did not perceive it till the fire warned them of the fate of the sacred building.

Having examined one side of the question, let us see what is to be said on the other; and first of the Temple of Jupiter Capitolinus. We have a careful account of it by that excellent historian, Dionysius of Halicarnassus. It was begun, he says (3. 69 and 4. 61), by Tarquinius Priscus, in consequence of a vow. It was about 200 feet square, the length exceeded the breadth only by 15 feet. The king commenced by levelling the ground, which was very irregular, and he also built huge αναλημματα, or retaining walls, filling in with earth behind them. Now, it has been urged that, however unnecessary this might be on the smaller summit (where, by the way, parts of such retaining walls remain to the present day) it would not be so on the other summit, which contains about three times the area. The work was continued by Servius Tullius, and finished, but not dedicated, by Tarquinius Superbus. Dionysius tells us, the Temple had three cells under one roof, dedicated respectively to Jupiter, Juno, and Minerva; it had three rows of columns in front, and two on the sides; but as he says nothing of the back, we may suppose that it was plain: here, again, is a strong argument that the Temple stood on the northern height. They would hardly place a handsome front where it could not be seen, and expose a plain back to the city, as well as to the rest of the Capitoline Hill, as must have been the case were the positions reversed. Besides, the triumphal processions must have approached the back of the Temple instead of the proper front, which we know faced the south. If the Temple stood on the southern hill facing the river, the only way of approaching the front must have been by the hundred steps, or by some circuitous route. Another argument equally conclusive, is, if the Quarterly Reviewer's argument is correct, and the Vitellians made their successful attack from the Lucus Asyli, they must have set fire to the back of the Temple, and not to the front, the fastigium, as Tacitus expressly tells us they did. Another strong presumption is taken from a passage in Pompeius Festus (voce Saxum); this, though somewhat mutilated, shews clearly enough, that the part especially called the Tarpeian Rock was separated from the part especially called Capitolium, because, he says, "they were unwilling that that unhallowed place (funestum locum) should be joined to the other." Whether by "unhallowed," he means on account of the death of Tarpeia, or, as is more probable, because it was the place of execution, does not appear. Still, on the latter ground alone, it seems inconceivable that the Tarpeian Rock, the Tyburn of Rome, should be on the sacred precinct of the Capitol. As well might we conceive the drop now at Newgate to be placed in front of St. Paul's. But we have shewn clearly where the Tarpeian Rock must have been; is it at all likely, then, that the holiest place in Rome, the dwelling of the Gods, the palladium of the city, should be in the closest proximity of the scene of the butchery of the executioner? It seems impossible.

We now have to examine the story of the attempt of the Gauls to surprise the hill by night, and its defence by Manlius, as given by Livy in his Fifth Book, and by Plutarch in the Life of Camillus. It will be remembered, that that General wished to communicate with the besieged, and a young man, named Pontius Cominius, undertook the dangerous task. Making a sort of raft with the bark of

trees, he swam silently across the river and scaled the rock, fortunately we are informed of the exact spot, close to the Altar of Carmentis; having delivered his message, and obtained his answer, he descended by the way he came, and returned to Veii. Shortly after, some of the Gauls wandering about, found traces where the rock had been ascended, and immediately determined to do the same in the dead of the night, and to surprise the garrison. "It was a dusky night," says Livy, "they sent before them one without arms to try the way, then some thrusting and some pulling each other up, as the nature of the ground required, they got to the top in such profound silence, that they not only deceived the sentinels, but the very watch dogs· But the geese were not deceived, which being sacred to Juno, had not been eaten, although there was the greatest want of provisions. This saved matters, for Marcus Manlius, who had been Consul three years before, being waked by their noise and the flapping of their wings, seizing his arms, and shouting to the others, rushed upon the Gaul who also had just stood on the summit, and thrust him down with a blow from the boss of his shield. His fall knocked down those behind, and the Romans, with their darts, and with large stones, soon routed the rest." The exact spot we know; now the question is, did all this take place in the Arx, or in the Capitol. It will be seen, it was all the work of a moment; and there are several strong presumptions that it was in the Arx. The first is, that Manlius lived there, he was a man of Consular dignity, it was not his watch, and there is every probability that he was sleeping in his own house, near which (in the area of it, as Livy tells us) the Temple of Juno Moneta was afterwards built, according to the vow of Camillus. Here also must have been the shrine, or some place dedicated to Juno, where the geese were kept. From the first alarm to the arrival of Manlius, a few Gauls only had time to get on the summit; so it is clear Manlius could not have ran from the other height, descended fifty feet into the Intermontium, and mounted up thirty feet again, traversing a quarter of a mile of ground. But, say the opponents, it does not follow that Manlius must have slept in his own house. The probability surely is that he, a man of consular dignity, the highest officer in the state, did so; but at any rate, if the northern summit was the Arx, that was the spot sacred to Juno, and where the geese must have been kept. Is it likely that they would hear at a quarter of a mile off what the men and dogs, who were close by, could not? And is it likely, if they gave the alarm there, that the Romans should not have ran to where they heard a noise, rather than have turned round in the very opposite direction? But, says Becker, you all admit that the Juno Moneta was built on the site of the house of Manlius, and that was in the Arx. We do; all the authorities agree on it, and as lawyers would say, that is part of our case. He then refers us to some very obscure lines from the First Book of Ovid's Fasti, 637, which literally translated, run thus: "Oh! white Concord, the next day places you in your snowy temple, from where high Moneta bears her lofty steps, and now you well behold the Latian crowd." And he says, there must have been steps from the Temple of Concord to the Northern height, where he asserts the Temple stood; but this is begging the question on the one hand; and on the other, the lofty steps were probably the hundred steps which we see from the Capitoline plan ascended the other hill. As the Temple of Vespasian was not built till long after, that of Concord would literally be at the foot of these hundred steps. It may mean, that a Temple of Concord stood on the hill near the Moneta, which latter was ascended by lofty steps. Now what has Becker to reply? he shifts his ground, and takes another, and what appears at first sight, a stronger stand. He shews that large meetings of the people used frequently to assemble in the Area Capitolina, and he contends, that the Temple must have filled up so much of the northern summit, that there was no room left for such assemblages, while on the southern hill there would be plenty of space. But this again is begging the question. There is no proof—in fact, it is very unlikely that the atrium, or τεμενος of the Temple, was ever intended for such meetings, or called the area. Let us turn to the account of the death of Tiberius

Gracchus, given by Plutarch in his Life, aud by Velleius Paterculus in his Second Book. It happened there was a large meeting of the senators, optimates, and kuights, and Gracchus came up with a mob (caterva) of plebeians, armed with clubs, and their togas gathered up all ready for a fight. The principal man of the opposite party was P. Cornelius Scipio Nasica. He went to the Capitol, Plutarch says (Paterculus tells us, standing on the top of the steps of the loftier part of the Capitol) and covering his head with his gown, in the same manner as the Pontifex Maximus was accustomed to do in the most solemn rites, he called on all those who wished to save the couutry to follow him. The patricians were unarmed, but they tore up the benches, and seized the legs and broken pieces, and charged the mob who were standing in the area; Gracchus fled, and as he was running down the clivus, a broken footstool was hurled at him, which struck him on the head and killed him. Now, it is clear from this, that the mob must have been in the Intermontium (which is here called area), for they were on the Capitoline Hill, not down in the Forum, but in a part below the steps. The presumption is from Scipio's performing the sacred rite, that he stood on the steps at the front of the Temple, and which, as has been shewn, faced the south; so that the whole argument appears to recoil against Becker, and another probability is added to the views of Canina.

I have now brought the second branch of the subject of the Roman Forum to a close. The next portion of the subject will be the Fora of the Emperors; and should my audience not be wearied with a mass of classic matter, which necessarily requires the closest attention, I propose at some future time, to enter into a short resumé of all the authorities on the subject, taking each object which now is, or which must have existed on the sites in succession; shortly pointing out what Livy, or Pliny, or Dionysius, or any other author may have said on it: and then shewing. whether from existing remains, ancient medals, or bas-reliefs, the probable restoration of each, so that we may have before us, in the most convenient form, all the materials for the satisfactory investigation and discussion of this most interesting and most important subject.

After the reading of the paper, Mr. Donaldson, H.S.F.C., proceeded to develop at some length his ideas respecting the buildings on the Capitol; the line of the Via Sacra; the position of the Roman Forum; the direction of its longer axis, &c., matters on which he differed very materially in many points from the opinions of the authorities mentioned in Mr. Ashpitel's paper. Mr. Ashpitel vindicated his positions; but, being prevented by the lateness of the hour from entering further into a discussion, expressed his willingness to bring the subject again forward for debate.

The thanks of the meeting were cordially awarded to him, and the members and visitors adjourned.

AN ADDRESS ON THE SACRED GROTTO OF ST. BENEDICT AT SUBIACO, AND ITS MONASTIC INSTITUTIONS,

DELIVERED

At the Ordinary General Meeting of the Royal Institute of British Architects, May 18th, 1857,

By M. Digby Wyatt, Honorary Secretary.

After the presentation of the Royal and other medals, Mr. M. Digby Wyatt, Honorary Secretary, proceeded to offer some observations on the above subject, regretting that the late hour of the evening obliged him to compress them into so narrow a compass that he was fearful it would be impossible to obtain for his subject that attention which, properly enlarged upon, he did not doubt its architectural importance and historical interest could not fail to ensure for it.

He commenced by reminding his hearers that St. Benedict was as completely the patriarch of the Western Monks, and the founder of all the properly organized monastic systems of Europe, as St. Paul, the proto-hermit, St. Anthony, St. Basil, and St. Jerome had been the precursors of those of Africa and Asia previous to his advent. During the first three centuries of the Christian era numbers of the persecuted occupants of the Catacombs fled to the rocky fastnesses skirting the Campagna of Rome, and there led lives of seclusion analogous to those of the Fathers of the Desert, and many such still dwelt in similar shelter, and in more or less complete isolation, in the days of St. Benedict, nearly two hundred years after the adoption of Christianity by Constantine. It remained, however, for that worthy Saint and unquestionably excellent man to introduce the bond of union and of common charity among such recluses; thereby instituting the system of mutual protection and good offices which lent that power to the regular clergy which enabled them to make head against the turbulence of a wild and rude age, and ultimately to attain an unprecedented influence over men and manners, history, literature, and faith, throughout the whole of the Middle Ages.

The monasteries of Subiaco, Monte Cassino, San Calisto at Rome, and numerous others in Italy and other countries of Western Europe attest, at the present day, the extensive influence exercised by the Benedictine Order, the proverbial protectors of such learning and science as were compatible with the rude energies of Mediæval life. From the great fountain head numerous branches germinated in later times. Saint Bruno (1030-1101) became the founder of the Carthusians, and Saint Bernard (born 1091) of the Cistercians—which latter body possessed Fountains Abbey (so worthily preserved through the zeal of the noble President of this Institute) and many of the fairest domains in this our native country.

The Grandmontines, Clugniacs, and Premonstratensians lived also under the rule of St. Benedict, though under a somewhat different discipline. In this country the possessions of the Benedictines were immense. With the exception of Carlisle they owned all the cathedral priories and most of the richest abbacies. Even at the period of the dissolution of monasteries, Bishop Tanner, in his "notitiæ," enumerates no less than 186 important religious establishments still in their hands, despite the active competition which existed between them and the Dominican and Franciscan Orders. Until the end of the twelfth and the beginning of the thirteenth centuries, when the founders of these two last named orders flourished, the Benedictines were the presiding rulers over architectural and all other art, and it can surely, therefore, be no uninteresting duty for us to trace out the vestiges they have left of their skill and taste profusely scattered around the spot hallowed beyond measure in their hearts by the unquestionable presence and love of their admirable founder.

With the age of St. Francis, great changes of every kind in faith, manners, and art were introduced, and one of the most interesting studies of the comparative anatomy of architecture which can be made is between the great monastic establishments founded by him at Assisi, and that established at Subiaco by St. Benedict. St. Francis was born in 1182, at the former place, and in its Church Giotto has represented the most remarkable events in his life in a well known series of fresco paintings. An analogous series of frescoes, representing the leading incidents of St. Benedict's life, and to which we shall hereafter refer, is to be met with at Subiaco.

This romantic spot, venerated by the Catholic as a shrine, and by the artist as one of the loveliest spots upon the face of the earth, is grandly situated in a gorge of the mountains about forty miles eastward of Rome. Its name is a corruption of Sublaeum, derived from its position below the artificial lakes formed by Nero in the grounds attached to his villa, by damming up the course of the Anio, a stream which ultimately falls into the Tiber above Rome. It was in this splendid villa that the scene so tersely and yet vividly depicted by Tacitus took place, when the lightning from Heaven dashed the golden cup from the tyrant's hand as he was carousing, and yet spared his execrable life. These artificial lakes existed for centuries, till on the 20th of February, in the year 1305, a sudden flood burst the barriers—the traces of which catastrophe may still be seen on the sides of the mountain gorge. Fragments of the remains from the Emperor's villa may be detected appropriated to strange and modern uses in the adjoining conventual and secular buildings.

The whole of the scenery about Subiaco is most wild and picturesque. The road to it from Tivoli, after following awhile the ancient Via Valeria, is carried along the very verge of the gorge,—the town perched on a height,—the monastery embowered in foliage,—and the magnificent ravine, by following the windings of which, on a strangely artificial path, it can alone be reached from the town, are subjects familiar to, and endeared to the memories of most tourists and artists. At the distance of about two miles from the town of Subiaco the gorge contracts, and the mountains on either side rise almost vertically to a height of little less than two thousand feet from the valley, along which the rushing Anio cleaves its noisy way. On the left hand side, at about one thousand feet from the stream, there are several small caves and a little table of land dark with Ilexes of immemorial growth, accessible only, before the formation of an artificial footway, at imminent danger to life. Far above these grottoes the cliff rises precipitously to another table of land at its summit. It was to one of these caves that St. Benedict fled, at the early age of fourteen or fifteen years, from the world and such allurements as the semi-barbaric age in which he lived could offer.

Born of noble parents, respectively of the Anician and Claudian families, at Norcia, in the Dukedom of Spoleto in Italy, A.D. 480, he was taken to Rome for education, where he became disgusted at the vicious courses of the inhabitants, in whom the graces of Christianity had at that period but imperfectly expelled the sensual traditions of Paganism, and fled, first with his nurse, and ultimately alone, to the deserted spot above described. Here it was that he was supplied with food by the generosity of Romanus, a monk of a neighbouring monastery, whose only communication with the youthful recluse was effected by letting down a string along the face of the cliff from the upper table land to the grotto in which he had taken up his abode. The life of St. Benedict, by Pope Gregory the Great, the especial patron of the Order, who was removed from its founder by but one generation, does not fail to depict the temptations which the Saint encountered from the evil one in various shapes in this retreat, and the manful way in which they were overcome. Subsequently he was induced to become the Abbot of the curious rock-cut monastery of St. Cosimato in the vicinity; but the strictness of his rule occasioned so many plots against his life that he returned to his former solitude.

His fame having now extended far and wide, numbers flocked to him, and through the liberality

of the faithful, he was enabled to erect twelve monasteries on the rocks surrounding his retreat. Having, with the assistance of his affectionate disciples, St. Maur and St. Placid, established and confirmed, in regular order, these religious establishments, the Saint went on to Monte Cassino. There he met with a set of inhabitants still profoundly embued with Paganism, and worshipping Apollo in a sacred grove. These misguided people he converted, and having induced them to cut down their sacred grove and to desecrate their temple, in the year 529 he laid the foundations of that monastery which, vastly increased in after ages, grew to be the great head quarters of the Order, and became for many centuries the depository of all that was most advanced in the art and learning of the Dark and Middle Ages. Here it was that the Saint expired in the sixty-third year of his age.

Of all the twelve monasteries established by St. Benedict at Subiaco little trace is to be met with in the present day. Lombards, Saracens, turbulent feudal chieftains, and dishonest administrators gradually swept away almost all that there was of the primitive institution, and scarcely anything but a few fragments in the neighbourhood, and the foundations of portions of the monastery of St. Scholastica attest the importance of the original institutions.

This last mentioned noble structure consists of an entrance courtyard, surrounded on three sides by a wall, and on the fourth by buildings; to which succeeds a cloister of modern date, arcaded on two sides. Beyond stands the oldest portion of the monastery ascribed to the year 1052, irregularly disposed to suit the site and formation of the ground, and much modified by insertions of later date, among the most important of which is a striking arch of "flamboyant" character. The refectory is situated between this cloister and one built by Abbot Lando in the year 1235. The ambulatory of this last is formed by bays of stilted semi-circular arches supported on slender marble shafts, with capitals and bases, in the Byzantine style, the whole bearing a strong resemblance to those to be seen in the cloisters of S. Saba and of Sta. Sabina at Rome. Large pointed arches of construction are seen in the refectory and in the church. The latter was built by Benedict VII. in 981, with a campanile of the usual early Christian character, but covered with a low pyramidal roof. At a much later period, in 1769, a new interior, in modern Italian taste, with a waggon-headed ceiling, was built within the outer walls, they being left almost undisturbed, so that the whole of the interior now visible is modern, with the exception of the apsidal choir end, which was not much altered. The exterior has been recently decorated in doubtful taste. The finely painted chapel of St. Michael and All Angels in the crypt is said to contain the body of St. Bede, but Bishop Ullathorne (R. C.) has recently proved, at once eloquently and learnedly, that this is not the Venerable Bede, our countryman, originally interred at Jarrow and stolen from thence to enrich the sanctuary of St. Cuthbert at Durham, but another personage—St. Bede the younger, a Saint of Italian origin and rather later date.

The mosaic work in the arcade of Bishop Lando's Cloister is attributed to the Cosmati family, who were much employed as architects, sculptors, and mosaicists at Rome, Orvieto, and elsewhere in the Roman territory. Seroux d'Agincourt, who gives careful plates of this cloister, and of the other buildings at Subiaco ("Architettura" tavole xxix and xxxv.) supplies a copy of the original inscription testifying to the above fact in the following words (the abbreviations being supplied):— "Cosmas et filii Lucas Jacobus alti Romani cives in marmoris arte periti hoc opus expleverunt Abbatis tempore Landi." [The architectural and round arch peculiarities of this cloister, which are of remarkable interest as compared with later works of the Cosmati in the pointed style at Rome and elsewhere, were very fully illustrated by Mr. Wyatt's drawings.] Santa Scholastica, whose name is attached to this monastery, was the beloved sister of St. Benedict, and a virgin dedicated to a holy life. She was the foundress of the important order of Benedictine Nuns, the annual revenues from whose temporalities in this country at the date of the dissolution of Convents, &c. amounted to very nearly £ 8000., a great sum at that period.

The Mediæval history of the Monastery of Santa Scholastica affords a striking illustration of the turbulent spirit which prevailed among the Barons of those days, and of the manner in which the Papal anathema, blended with apostolic admonition, was necessarily called into action to maintain at once the influence and the possessions of the Church. Here almost within sight of Rome, the Pope's authority was boldly set at defiance by the Barons, and it was only through the great Hildebrand's placing a man of known nerve and determination, Abbot John, at the head of the establishment, after deposing his weak predecessor, Abbot Humbert, in the year 1062, that right and order could be established, and the monastery secured in the full enjoyment of its patrimony. Not only did this same Abbot John carry on many of the works which had been begun by his predecessors at Santa Scholastica, but he also made a wonderfully costly road to the Holy Grottoes, and completed the various noble chapels surrounding and protecting them which had, so far as the lower chapels are concerned, been begun by Abbot Humbert.

About a mile and a quarter distant from Sta. Scholastica, by a lovely path winding along the precipice, and supported for the most part on buttresses clinging to its face, are the monastic buildings connected with the "Sagro Speco," the cavern in which St. Benedict is stated to have taken refuge, and the picturesque situation of which has been already fully described. The approach to them from the entrance gate is under a grove of Ilex trees, the impenetrable shade of which upon a sultry day never fails to be most refreshing to the pilgrim after his toilsome walk along the somewhat rugged mountain path. The peculiar nature and position of the caverns have given rise to the form and arrangement of the monastic buildings and chapels grouped about them. A huge portion of the rock, that over which St. Romanus is related to have lowered the cord with food for St. Benedict, overhangs the monastery in a manner so obviously and imminently dangerous as to afford occasion to the monks to adduce its position as a proof of direct divine interposition in their favour. The scene on entering the Upper Church is most striking. The rays of light from its single west window fall everywhere upon surfaces glowing with colour. With the exception of the time-stained marble pulpit and its curious coffered ornaments, evidently imitated from the fragments of the lacunariæ of the Villa of Nero, all is fretted with an endless variety of hues. Even the fine old pavement of Opus Alexandrinum ministers to the brilliancy of the general effect. The largeness and simplicity of the early pointed forms, the size and severity of the painted figures and groups, and the grand unity of aspect in shade produced by the admission of a flood of light at one point only, effectually prevent the slightest approximation to frittered or meretricious grace. Behind the high altar of the Upper Church, a descent of a few steps, on either side, leads to the Chapel of Sta. Scholastica, from which a long descent of steps passing under the high altar of the Upper Church communicates with the Lower Church or crypt. On the lowest level of this church, and between the side work and the living rock, is the grotto of St. Benedict. Following the sinuosities of the precipice outwards, steps still descending lead to the Chapel of St. Lawrence, and over it is the Chapel of St. Gregory, to which access is given from the lower Church by a species of mezzanine gallery. At the lowest level of all is the so-called Rose Garden (once filled with briars till the advent of St. Francis), with various other grottoes cut in the rock.

The Gothic of the churches in the Sagro Speco may be described as good Italian Gothic—decidedly distinct from our Western styles—and more similar to that found in Sicilian buildings of like date, than to any other examples of early pointed work to be found in the North of Italy. It is however to the vast amount of coloured decoration on the walls, especially of the upper church, that the peculiar interest and charm attached to the building is to be ascribed. [Mr. Digby Wyatt had seen before he left England the effect which a partial use of colour would produce, in the church which the late Welby Pugin had constructed at Nottingham in this kingdom, and in other buildings by that

accomplished architect, executed prior to the year 1846; but it was not till he visited Subiaco, that he realized the satisfactory result of an ecclesiastical interior entirely covered with coloured fresco paintings and ornamentation. It was more especially on this account that he was induced to make elaborate studies of the interior in most of its parts—accurate representations of which, done upon the spot, he exhibited to the meeting. Carefully, however, as they had been made, Mr. Wyatt regretted the impossibility of doing justice to the singularly picturesque aspect of these beautiful chapels]. With their richness of tint, strange diversity of plane and level, singular contrasts of brilliancy and sobriety of lighting, every step produced some new picture—some fresh and happy combination; and he felt that there was in them sufficient work for months of an artist's time, rather than for the happy week or ten days only he had been enabled to devote to them.

The Chapel of St. Gregory contains a fresco portrait of St. Francis, dated 1223, the time apparently of his visit to the convent—which from its representing him with the cowl of his order, instead of the nimbus of canonization, might be assumed to be a faithful representation done from the living man.* In the lower chapel, the establishment of the community of the Sagro Speco, by Pope Innocent III., and the donation of the Bull to the first Prior John Tagliacozzo in 1213, are represented in large frescoes, in which the probability of portraiture is again apparent. Such a faithful mode of handing down historical events pictorially to posterity might, Mr. Wyatt observed, be worthy of attention in the present day, as decidedly more instructive and rational than portraying imaginary Cœur de Lions and Joans of Arc in our houses of Legislature. Another fresco of great beauty and a later date (1489) in the Chapel of the Beato Lorenzo Loricato, signed by Stamatico, is a highly interesting example of the state of the art of that time.

The fresco decorations of Subiaco possess much greater interest in the history of painting than has been generally ascribed to them. They are unquestionably of at least four distinct and highly characteristic periods.

The first or earliest specimen in the rude manner of the artists of the catacombs, which is roughly painted against the side of the lower grotto, less difficult of access than the upper one, and in which it is said St. Benedict first received those who came to receive his admonitions and attend his ministrations, may very possibly date from the age of that saint, *i. e.* from the commencement of the sixth century.

The second set of examples is in the stiff and severe Greek style which preceded the manner of the great Florentine innovator, Cimabue. To this belong many of the paintings in the lower chapel, first built to protect the Sacred Grotto; and among them may be noticed especially the Representations of the Establishments of the Community, by Pope Innocent III. (1198-1216), the Consecration of the Church by Pope Gregory IX, and the Virgin and Child supported by Angels. This last is to be especially noted as to be identified by the inscription "Magister Conxolus pinxit hoc opus." This Magister Conxolus was a Greek, and authorities (Lanzi and Bishop Ullathorne) are agreed in considering that he worked at Subiaco as early as the year 1209, thirty-one years before the birth even of Cimabue. It may not be unimportant, in connexion with this date, to observe, that many Greek monks, who had been driven away from their monastery at Grotta Ferrata in 1165, by the wars which at that time took place between the Albanians and Tusculans, were residing at the Sagro Speco, to which they had fled for refuge. Through them it was that the establishment at Subiaco became possessed of that most interesting relic, evidently of great antiquity, the black camel's hair cowl, said to have been the capouche or hood of St. Basil, and to have been brought to Italy by his friend St.

* An engraving from a careful tracing of the head of the saint will be found in D'Agincourt's great work (Pittura, tav. c.)

Gregory Nazianzen, by whom it was presented in the year 378, to the then Abbot of that very Monastery of Grotta Ferrata. Under the auspices of such a body as these Greek monks, it seems anything but unreasonable to suppose that the skill of Conxolus must have been fully developed. In 1066, we know from Leo Ostiensis, that Desiderius, Abbot of Monte Cassino, desiring to rear a noble church in honour of St. Benedict, had sent to Greece for skilful workmen in mosaic; and their works mainly contributed to give that great stimulus to pictorial art which led to the ultimate formation of the South Italian School.

The third set of paintings, those for the most part in the upper and middle chapel, giving touching and spiritual representations of sacred subjects and legends from the lives of St. Benedict and his sister Scholastica, have evidently been wrought by one carefully tutored in all those changes in religious art which were introduced under the auspices of the Franciscan and Dominican Monks. They apparently date from about the year 1400, and as we know that Subiaco had an artist about that period, who wrote the following inscription (copied by Dr. Ullathorne) on a picture still preserved in the old Church of St. Eustace, not many miles distant: "M. Bartholomew, of Subiaco, painted this work with good faith in 1424. oh Lady help me, I ask no reward but this," we may be not very far wrong in supposing that some of these works may have been from his hand.

The last set are those in the exquisite little Chapel of St. Lorenzo Loricato, in which a considerable degree of beauty, both of form and tender colour, are blended with a singularly archaic treatment of form, shown more particularly in the draperies, This severity of treatment is extremely unusual at so late a period as the latter half of the fifteenth century, when Naturalism had already acquired a great ascendency over the artist mind; and if the painter of the principal subject over the high altar—the Virgin and Child surrounded by Saints—was not attested by his nearly adjoining signature of "Stamatico Greco pictor perfecit, A.D. 1489," one would naturally antedate the picture by nearly one hundred years. As it stands, this series of frescoes curiously illustrates the clinging of the Greek artists at even so late a date, and despite great improvements in feeling, form, and composition, to their old rigidity of action and arrangement.

[Mr. Wyatt, after expressing his obligation to Bishop Ullathorne's graceful and learned account of his visit to the monastery for much of the historical information he had been able to bring forward, concluded by expressing his regret that the hour was too far advanced for him to tresspass further on the attention of his auditors, although he felt most strongly that his subject was one replete with the highest interest to all students of art and archæology, and by no means devoid of importance to the practical designer and architect.

The thanks of the Meeting having been most cordially voted to Mr. Wyatt, the Members adjourned].

SOME REMARKS ON DOMES,

Read at the Ordinary General Meeting of the Royal Institute of British Architects, June 1, 1857,

By T. H. Lewis, Fellow.

Of all the forms created by the architect, the dome is perhaps the noblest. There are few of us who have not seen with admiration the immense domes of Rome and of Florence towering high above all around; and here at home, the dome of our cathedral, bursting through the smoky cloud sent forth from the myriad of houses, majestically rears its golden cross, and constitutes the well-known crowning feature of our city. In the following general sketch of the origin and the progressive development of outline of Domes, I propose to enter but very slightly into the question of construction, though I think that this part of the subject has not yet been treated as it should be, and that a monograph of it, working out the theory from actual examples, is still wanted.

Late discoveries in Egypt and Assyria have laid open many a work of ancient art before unknown; but we must still seek in Greece for the earliest examples of our subject, viz., at Mycenæ and Orchomenos; to which two instances we seem limited in that country. The Abbé Winckelman indeed, no mean authority, maintains that the Greeks through all ages used this form of covering; but I have carefully searched the passages to which he refers, and find that his only grounds of belief are the use of the word θολος by Pausanias in his description of several buildings, and some exceedingly doubtful passages in other authors. Pausanias makes no mention whatever of any peculiar form of covering, and I believe the meaning of the word θολος as applied to a dome is a later reading. One instance, however, of a bas-relief in the Clementine Museum, to which the Abbé alludes, gives at first sight some colour to his theory. I find, however, that it represents a tower, apparently of wood, on the prow of a ship, and that the date of the bas-relief and of the invention of the towers themselves is uncertain. It seems to me that the most inveterate essayist could scarcely found a theory upon this. I have also been reminded of a doubtful passage of Cratinus referring to the Odeum of Pericles; but Vitruvius, who gives a long description of that building, makes no mention of a dome. In Sardinia we have those curious buildings described by M. Petit Radel. In Etruria we have some few instances such as I have given from Riello; and in the Crimea, the tomb of Mithridates at Kertch: but the dates and the builders are doubtful, and we must return to Greece before we are on sure ground.

At Mycenæ we see the form, if not the construction of the dome, worked out by a master hand with no little skill; and most singular is it that for nearly 1000 years (so long is it to the next example) that form remained, so far as our knowledge goes, uncopied, though in the heart of the country. For it is not a ruin whose form can be developed only by the patient labor of the antiquary. The hand of time, which has weighed heavily on works of a later date, has passed gently over this, and whilst it has only spared a few columns at Corinth and at Thebes, and little at Argos and Epidaurus but the rock cut steps of their theatres, it has left this earlier work almost unscathed, as though to teach us how great was the nation whom we once called barbarian, though their history, their name and race can now only be conjectured. Between the Treasury of Atreus and the Choragic monument (an example so small as hardly to be quoted except as a connecting link) there is a gap of 1000 years—a space which contains the lifetime of a nation—sees its rise and its decay; and yet amidst the buildings, the sculptures and the vases whereon so much of the nation's character has been written, I cannot recall one instance beyond those that I have mentioned to

show that the dome was ever used by the Greeks; that nation whose fertile mind teemed with inventions in art, in poetry, in everything, I am heretic enough to say, but in architecture. For beautiful as their one form once was, and refined in detail to an extent that we can scarcely yet appreciate, the form was still one, which, varying only in detail, might have served as the model of nearly every temple from Pæstum to Ionia.

The tiny monument of Lysicrates is interesting so far as, were we disposed to trace art forms up to their earliest source, it would offer the first instance of a dome, raised on columns, and showing the domical form both inside and out. This monument is of singular beauty, but it can now, perhaps, be better judged of casts and drawings than from the reality. For it is (or was a few years back when I saw it) half buried in rubbish and filth, and to be approached only through a nest of squalid hovels. Another jump of some 500 years brings us to a number of examples, showing the outline of the dome almost perfected—at Rome the Pantheon, the Temples of Venus, of Minerva Medica, and the Baths of Caracalla—at Baiæ the Temple of Venus—at Pompeii the Baths, show us the form developed, while the grandeur of many of those examples still left teach us how very many we must have lost. In some small remains at Mylassa in Ionia, of perhaps earlier date than the above, the Greeks made a great advance by covering a square space with a domical structure, and raising it on columns by a method which has been well described by Mr. Fergusson in his Handbook, more especially in reference to Indian domes. This method is the one that we might expect would be first adopted, and consists simply in covering the angles of the square with a flat stone or girder, then repeating the process and thus gradually obtaining a near approach to a circle. At Mylassa the arrangement seems to have been well managed, and to have produced a very pleasing effect. In the Indian domes the arrangement was still more picturesque; but the whole must, I think, be considered as a rude way of getting over a difficulty. We have an example of 1000 years later date than that at Mylassa in the Temple of Pandrethan in Kashmir, but formed on precisely the same principles. I remember but one instance of its use in an interior in modern times, viz. at Sta. Balbina at Milan, where the angles are cut off in the most abrupt manner, and the effect is disagreeable in the extreme. But a remarkable instance of its use externally may be seen in Palladio's celebrated villa Capri near Vicenza, where the dome, with a low stylobate under, is placed directly on the square hipped roof—not raised above it as shown in the engravings, but sunk into the sides in the most awkward manner. At Mereworth Castle, Kent, this example has been copied, without the cutting into the roof, which is better, but with a higher dome, which is decidedly worse. The external effect of this abrupt change from the square to the circle could scarcely be pleasing anywhere, and it is surprising to find that we must look for the most numerous examples of its use amongst the picturesque churches of elegant Palermo. No effort is there made to conceal the transition, and the effect is certainly unpleasant. There are some examples also at Cairo and Ancona, but the change is there softened by an octagon being interposed.

The next attempt to get rid of the harsh effect of the horizontal angular pieces internally would be, we may imagine, to fill them up by a slanting projection starting from a point at the base, each filling-in piece being triangular. Yet this is by no means the earliest in point of date, and very few examples of it in its simple form as applied to interiors exist. The best specimens are, perhaps, to be found in the French churches of Loches, Uzerche, &c., so well described by Mr. Petit. But the honeycomb pendentives of the Saracens, seen in the Mosque of Hassan at Cairo, the Cuba at Palermo, and the Pathan Mosque at Delhi, may be ranked in the same class as a beautiful variety. The transition externally from the square to the round may be made in the most ready way, by merely slanting off the angles; by which

simple expedient a very beautiful outline has been produced by the Arab architects, as will be at once seen in the well known tombs at Cairo. The same expedient has been sometimes used in later times, as in the well-known villa at Chiswick; but considering the picturesque effects which the Arabs have proved can be produced by this easy plan, I must say I wonder that it has not been more often adopted—more especially as the Gothic architects have shewn in many a beautiful example, in their spires, how picturesque the connection between two dissimilar forms may be made. Somewhat of this treatment may be seen in the dome of Ani in Armenia; but I cannot help regretting that the Gothic architects did not adapt to their own forms that of the dome, and complete the beautiful beginning made towards it at Ely. The next change would be probably to support the angular filling in by an arch; and at Serbistan we see this arrangement complete. It is, indeed, so strikingly like the Arab forms of 800 years later, seen in Palermo, that we hesitate at first to assign it to the fourth century. But we have good authority for so doing, and indeed the remains now disinterred in the East shew us how little is our present knowledge of its art. Who for instance, looking at the battlemented turrets and round arched dome of the Assyrian sculptures would, not knowing its date, venture to assign its real one? Or who would consider the Temple of Payach, in Kashmir to be of the age of Theodoric, or the pointed arch at Bisotoum to be of the fifth century? and yet we have excellent authority for these conclusions. And, indeed, changing in all else, the East retains its art traditions almost unchanging; and the art workman there produces his tapestry and mosaics after the same likeness as his ancestors have done for centuries before him.

The models at Serbistan and Ferouzabad however, if followed, seem to have left few immediate copies, and for many a year after we see no trace of their influence. In Italy we now find the great circular buildings of Nocera, Sta. Costanza, &c. All these seem to have been formed on one plan; the builders got some old columns on which they put as many old capitals as they could find, without much regard to size or form. A tall base made amends for a short capital, and where capitals and bases enough were not found ready made, others were worked out in rude similitude. The columns being ranged in circles, a drum was carried up over them, and a large dome covered all; yet, rude as is the whole arrangement, there is a picturesque and quiet effect in the mass that is very pleasing.

Of a somewhat later date is the well-known tomb of Theodoric at Ravenna, as picturesque in effect as bold in construction. A dome of 35 feet diameter in one solid block of stone, hoisted some 50 feet in the air, would startle a modern mason; but though its foundations were, when I saw it, under water, scarcely a fracture could be seen throughout the building. Were not the date of this also well authenticated, we should hesitate to place it where we now do.

Another method, more scientific, and perhaps more artistic, took the place of that of Serbistan. If we round off the top edges of these exterior angular gussets to the form of the circle in elevation, we shall have externally the Byzantine form of pendentive. But the Eastern architects seem to have worked out the form in a different way, best described by Mr. Petit.*

Externally the Western dome corresponds in diameter to one side of the square on which it is described, but in the Eastern the diameter is often equal to the diagonal. Try this on the model and see if anything can be more unpromising in outline than the huge overhanging on each side of the square. But cut off this projection and see how picturesque is the result. On a square, on an unequal sided figure, on a polygon, the result is the same, and I believe that no more picturesque outline was ever invented. From its earliest use down to the present time—as exemplified in the beautiful Indian canopy

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* Architectural Studies in France.

exhibited at the Crystal Palace of 1851, this outline has supplied forms of beauty throughout the East.

To individualize the specimens of this form, for the first idea of which we are, however, indebted to the Romans, we must begin with Constantinople. The earliest church there (Agios Sergios) has much in plan resembling the Temple of Minerva Medica at Rome, and its picturesque arrangement of columns might once have existed in its prototype. But in the next example, the celebrated Sta. Sophia, we have the Byzantine pendentive clearly worked out between lofty arches and supporting the dome above, with an outside ring of arches added, shadowing forth, perhaps, the later mode of the circular peristyle.

On S. Vitale, a work of the same Emperor, I need not dwell, as its picturesque form is known to all. But at Agia Theotokos, at Constantinople, a very important novelty was introduced in the external treatment, and very worthy is it of notice. It consists in carrying out the outline of the internal arches where they cut the dome, ornamenting them with massive archivolts carried on marble columns, and thus breaking up the base of the dome by a wave line in place of the level cornice.

There are a few examples in the West of Europe. The exterior of the S. Aposteln, at Cologne, is a very good specimen, though the internal arrangement is like that described for Serbistan. But in Greece, the form is everywhere met with as a native style; and the churches, springing as they do from the square to the cross form, raised in the centre by these domes, and coloured in the boldest way by the use of marble, brick, and terra cotta, have an effect scarcely to be imagined.

I would here give a few minutes investigation to a church which deserves, I think, most careful examination, S. Ciriaco, at Ancona; an architectural work fine in itself, and occupying a site not to be exceeded for beauty. It is evidently the work of many ages and bears the mark of many changes; it has met with unscrupulous restorers, who yet have left enough to tell the tale. In a case like this we feel the want of such a guide as Willis has been to several of our own cathedrals. In Italy many a patient antiquary has written the history of these old places carefully and well. Fabri has worked hard for Ravenna, Severano for Rome, and Maffei for Verona, but they all worked from books and not from the stones themselves. They have not traced, from the change of style, of moulding or of masonry, the various works of the various builders, and there are few of us, I am afraid, who can afford the time to do so on the spot for ourselves Now here as an instance, D'Agincourt and Serra di Falco gave 950 as the date, while Milizia names about 1,300, and assigns it to Marghettone of Arezzo. I have no doubt whatever that the local tradition is correct, and that, next to S. Vitale, it is the most ancient dome in Italy, whilst it ranks first for being on detached piers. But it was largely altered in later times, and Milizia's date applies to them. This is borne out by an inscription in the church of the Misericordia in the same town, where the date is recorded as shortly after 1349, and the dome is a clumsy copy of S. Ciriaco. The latter is built on the plan of a Greek cross, each of the transepts being raised seven steps, with a chapel under. The walls of small square stones are unplastered, all the arches circular, and the aisles groined. At the intersection of the cross is a dome resting on a curious pendentive, half Byzantine, half arched, and worked as though by a novice at the craft, for the lines of masonry, instead of keeping to the circle, run into each other between the arches at a slight angle. Above these is a high drum, and above that a dome, both being twelve sided inside and out, but carried upon a series of ribs converging quite in the Gothic system of construction and of form. The beautiful porch is clearly a much later addition to the church, and I have no doubt, the work of the 14th Century. But I am inclined to think that all the dome is of the earlier date, and if so the church has a right to a higher

rank in the scale of art than it now has. The ornamentation throughout is very curious, and the church is altogether worthy of a much more careful study than I had time to give it. One other point about it, however, deserves attention. The dome is finished with a small lantern, an addition which at once suggested, and indeed required, a great change in construction and arrangement. In the ordinary form, where no weight had to be supported but that of the dome itself, the construction adopted was of a boldness scarcely to be imagined, and the tenuity of the section, and the lightness of the material (the dome of S. Vitale, for instance, being of pipes only) show how much more easily this beautiful form of covering can be used than is generally thought. When, however, the lantern was added, a change became at once necessary to support the extra weight. At S. Ciriaco there is a series of ribs in addition to the thick covering itself. At Bergamo the thickness of the dome is increased. But in later times and with larger domes, a double covering (as seen very clearly at Florence and at St. Peter's) was used, and by this means, the external form of the dome often became quite different from the interior and much more nearly approaching the cone. Up to this time, also, the dome, in Western Europe at least, seems to have been treated almost entirely with regard to the internal effect, its exterior, with few exceptions, being left unornamented and bare. But there are few churches of later date in which this feature was not as carefully finished externally as the rest of the edifice.

The next example worthy of note is Sta. Fosca, at Venice, where the dome is unfinished; but the plan is one of much beauty and the pendentives are arranged with great elegance. Were this church completed, I know no building that would exceed it in beauty of outline, or be more worthy of imitation, if imitation there must be, for our present form of worship. Of St. Mark's every detail is so well known that I need not dwell upon it. Altered as the church is, and added to in later times in a way that must overturn all our ideas of correct restoration, there is a spell in the old building that more chaste forms cannot excite; and were the windows that now admit an unsubdued glare toned down by colour, the interior, in effect, would almost exceed the imagination. Outside, it seemed to me that, whether by the gorgeous light of day or the softer gleam of night, the Piazza of St. Mark, of which this forms the most striking feature, is unsurpassed in beauty.

The church of S. Tomaso at Bergamo now succeeds, in which the lantern has become an important and massive feature, and the old plan of hiding the external form of the cupola by a sloping roof is revived after a sleep of some 600 years. Since the time of the Roman Baptisteries the dome had shown its own honest form inside and out in nearly every instance, but now we have it used merely as a vault covering inside, whilst the exterior shows no more trace of it than our Gothic high pitched roofs do of the groined vaulting they cover. The reason of the change is worth inquiry. These workers of old seem to have been too earnest in their work to alter merely for the sake of altering. They had the same climate, the same materials, I think the same skill, as their fathers, and when the interior vault was turned, the main difficulty was gone. The remains of the vaults of Minerva Medica and others, standing wherever stand the walls on which they rest, show that time does not destroy them more than other forms of covering. Was it that the part between the springing of the dome and the eaves of the roof gave space for the picturesque arcade so beautifully worked out in the Rhenish churches? Whatever the motive, those who have studied in the cities of the Rhine can scarcely regret the change. This roof cover seems to have been very general about this time. We find its form most picturesquely developed in Germany, in Italy, and even in Armenia, where the tomb and cathedral of Ani and the church of Dighour excite our admiration.

But, amongst the Arab workmen in Egypt and Sicily, the old form continued in use, and it is to this date that we owe the beautiful interiors of the Mosque Barkauk at Cairo, and of S. Giovanni, S. Simone, and the Capella Reale at Palermo. The church of Agia Theotokos at Constantinople, those of

Ani and Dighonr, and that of the S. Aposteln at Cologne, may boast of having been almost the only ones to this time where the tambour was made ornamental, and the dome and substructure were thus brought into one harmonious whole.

Our next great example is the Baptistery at Pisa, where the dome is so utterly false, inside and out, that the whole must be looked upon as an exceptional case, not to be classed or reckoned; while the great Baptistery at Florence, beautiful as it is, has been so altered, and the times of the alterations are so doubtful, that its date can scarcely be fixed. The Baptistery at Parma is of clearer date, but I doubt if the upper range of arches which screens so falsely both dome and roof, is coeval with the building or part of the design. I thought not when on the spot.

The next is Brunelleschi's great work at Florence. But before beginning the sketch of these later works, I would devote a short time to consider some other detached specimens of the Mediæval age in Germany and France. In fact, in thinking over these memorials of a by-gone time, we feel the same regret as in roaming through their aisles and cloisters. There is a fascination about them which time will not, I fear, ever give to those of later date. St. Peter's and St. Paul's, and Sta. Maria at Florence, may astonish us by their greatness and their grandeur, but I doubt if our descendants will ever pass with such solemn feelings through them as we do now through the aisles of S. Ambrogio, at Milan, or the cathedrals of Mayence, or Lincoln, to which I think those magnificent lines of Byron could be better applied than to St. Peter's—

> "Enter. Its grandeur overpowers thee not,
> And why? It is not lessened, but thy mind
> Expanded by the genius of the spot
> Hath grown colossal."

That this difference in the feelings caused by the earlier and by the later works exists is certain. It were too long now to analyze it. In the churches of France, at Blois, Loches, Uzerche, Perigueux, Angouleme, and other towns, we find a series of domes of the most picturesque forms, of all classes and of the boldest construction. The details have been well illustrated by Mr. Petit, and each of these churches is worth a careful study. At Ratisbon, the Baptistery, a small building of uncertain date and of a picturesque plan, has an arrangement of pendentives which combines the Byzantine and the arched system, and has a very good effect.

In all these works I have not, I believe, found any construction but that of brick and stone; timber does not seem to have been used. Yet the bold roofs at Padua and Vicenza show what the men of old could do, when they willed. We must now bid adieu to them and come to those whom we must rank as moderns. And, truly, there have been giants even in these days; for the changes made in the form and treatment of the dome by modern architects have made it a new feature. Of all these great men, I reckon Brunelleschi as the first, in rank well as in time. The cathedral of Florence would be, perhaps, enough for his fame, but the beauty of proportion and details in S. Spirito, S. Lorenzo, and Degli Angeli, bear witness to it, perhaps, still more.

Yet even with him the dome is in one case concealed by an external roof, and in the other, only timidly shown. The cathedral has its dome still unfinished, and not until all is done as he designed it, can its beauty be appreciated. The large cornice at the base has but one side finished; the small arcade at top is in the same state, the naked bricks show where the marble should, and tiles, as a covering to the whole, impoverish the look. The Roman who covered his Pantheon with bronze would have laughed at the change, and those who complain of want of zeal in the nineteenth century, may think of what was left undone in the fair t city of the fourteenth.

For St. Augustin's at Rome, D'Agincourt claims the credit of having the first dome elevated upon an ornamental high tambour; but the Armenian churches certainly forestalled it, and the polygonal finish to S. M. delle Grazie at Milan may rank with the works of any time, for beauty of conception, both in outline and colour. Between this and St. Peter's comes the beautiful church of S. Andrea, at Mantua. But I am afraid that the dome, which forms so fine a feature, must not rank as Alberti's, but that it is of a much later date. St. Peter's succeeds, and with it comes the use of that marked feature of nearly all the later domes, the peristyle of the tambour. So far, I believe, as our knowledge extends, this was the creation of Bramante, an architect as bold in conception as delicate in his details. This peristyle forms the most prominent object, both in his design and in that of Sangallo, where it is at once carried almost to extravagance. Michael Angelo's design is, perhaps, more simply grand than that of either of his predecessors, but I must say boldly that the outline of our own St. Paul's excels them all, and that I know nothing to exceed the exquisite proportions of its form. St. Peter's has its noble colonnade, and, in the Vatican and its Loggie, accessories, of which we cannot boast. But its dome starts from the general line as if unconnected with it, and almost as if sunk in it; the splendid view, so well known to all, of its great front and immense piazza, is taken from an imaginary point, and is one which never can be realised, unless some hundreds of houses are destroyed. And in the Eternal City houses, and aught else standing in the way of improvement, are much more likely to be carefully preserved. Now St. Paul's, seen closely as it is, shows itself clearly as a mass, with the dome springing from it and rising out of it without effort, and as part of the whole: and, if ever it shall be seen clearly from a wide opening in any quarter, our fellow-citizens, who know not architecture, and who have all their lives seen, perhaps unmoved, this noble work of Wren, will find for the first time that they have a work which, at least, rivals the greatest of other capitals. Palladio, in his St. M. della Salute, at Venice, has boldly used another method, and nothing, perhaps, on that site could be happier in effect. He resists the apparent thrust of the dome by huge consoles, which he renders ornamental by making them pedestals for statues. In another great work of his, the Redentore, there is a curious perspective effect. The dome is stilted up for about a quarter of its height, without any moulding or set-off, and the result is that, both in reality and in drawings, it appears to bulge very much at the springing.

Wren, in his St. Stephen's, Walbrook, has produced a church of striking originality and beauty, and no form, perhaps, of the style, could be better used for our churches. We may too, in London, boast of two modern domes, at the Coal Exchange and at the Museum, whose novel construction in respect to material, has been very successful, and whose outline, mode of lighting, and decoration give them a high rank. At Rome, the churches of SS. Trinità dei Pellegrini, S. Andrea al Quirinale, by Bernini, and S. M. Lauretana, by Sangallo, deserve attention. In more modern times, the Basilica of Sta. Francesca, at Naples, by Bianchi, has been crowned with a dome of 12 feet greater diameter than St. Paul's. At Paris, the French may boast of the iron roof of the Halle-au-Blé, of the domes of the Pantheon, the Val-de-Grace, the Invalides, and the Sorbonne. But, except that of the Pantheon, they are not remarkable for elegance. Russia lays claim to more attention, and the recently erected church of St. Isaac at St. Petersburgh has a dome treated in a novel, and seemingly, successful, manner.

I must now notice a few specimens of eccentricities, merely to put them on record. In Sebastian Serlio's work there are several designs for domes, oval on plan, and, in several places, the idea has unfortunately, been worked out. The most notable examples are the Cathedral at Pisa, and the two churches at the end of the Corso in Rome. At Pisa, from the situation and accessories, the defect is not so much noticed; but, in the twin churches at Rome, each presents—except when seen directly

in front, or at the side, a different outline from the other, and the result is as unsatisfactory as can be imagined. Internally, the effect is not so bad, and, in several instances, quite the reverse. At the church of Ara Cœli, at Vicenza, for instance, the plan works out well; and there is one at Rome, I think, by Borromini, equally satisfactory. As curiosities, or monstrosities, as you like, I may instance the Eastern domes of the mosque at Tabriz, the Taj Mehal at Agra, and a dome at Ispahan, where the bulbous form of the exterior swells out beyond all concord with the interior, and every principle of construction, and, I think, of beauty, is sacrificed to a wish for novelty. To go into all the varieties of form would be a useless task. They range from the steeple-like dome of S. Leonard at Frankfort to the flattened top of the Four Courts at Dublin, a building which, by this false outline, has just missed being one of the most pleasing and picturesque in the kingdom.

A few words as to lighting and decoration. I cannot but think that, however well a dark and gloomy effect may harmonize with the object of the church, yet, if the building itself be well lighted, the dome should be so too. To arrange this, I know no way more simple than the central light of the Pantheon. But other methods have been successfully used, and, as at the Minerva Medica, or better at Nocera, and best at Serbistan, the light has been admitted through many small openings in the dome. To leave the dome in darkness is to lose its whole effect, and to make it of no more value than the roof that I remember in a country town in Italy, where, at the springing of an unfinished dome, the flat roof was so hidden by being painted black, that it had all the appearance of a dark vacuity. A very picturesque way of lighting may be seen in the small semi-dome behind the altar of S. Sulpice at Paris, where the light enters from behind a large cornice, whose projection conceals the source. A large cornice of this sort is introduced, with excellent effect, in the church of Monte Berico. This church offers, too, one of the most notable instances of slight piers that I remember.

For decoration, I know nothing to equal in effect the old mosaics. Their richness of colour, and the splendour of the gilt grounds which give grandeur without gaudiness, make them unequalled, and the treatment of the figures and scroll-work is never such as to break up the general outline. The whole seems to form part of the general design, and not to break the sweep of the dome in any way. This art is certainly not progressive. At St. Peter's, indeed, the modern mosaics tell extremely well, but they are of the most simple kind, and where elaborate effect is tried, as at St. Mark's, the result is painfully inferior to that of the old. These later artists put in pictures, when what was asked for was decoration. In later times still, some perhaps of the most successful attempts have been made in the beautiful Genoese churches, where the artists have, as it were, identified themselves with the architect, and produced work which harmonizes with his. But whatever the style of decoration be (and I say it with all the diffidence becoming a junior member of the profession), I am sure that any style must fail which, carried out like Thornhill's at St. Paul's, breaks up the beautiful contour of the dome with columns and arches, and other forms utterly foreign to its outline.

In reviewing the whole subject, the most inveterate admirer of the Middle Ages (and I confess to being one myself) must, I think, admit, that the dome owes much of its grandeur to the moderns; and, admiring as I do the picturesque effect of the Greek churches, I cannot help thinking that I would scarcely exchange the majestic dome of St. Paul's for theirs. I know its waste of space—I know that one half of it is, inside, a dark mass, encumbered with timber and with brick-work, and I know that the others are small because they tell their story truly, and show without what they are within. But the peristyle, the lofty dome, and its grand lantern, have a look of majesty that defy its rivals, and almost reconcile us to all its faults. And in the days of old the architects found at St. Mark's the same want that Wren did, and supplied it in the same way.

One word more.—Of all these glorious works that we have reviewed, who were the authors? Wren we know and glory in, and Angelo, Brunelleschi, and the architects of Sta. Sophia are household words to us. But of the multitude of other works which are spread over the land, who were the workmen? whence came they, and where did they learn their craft? It was no common skill that poised the stones at Mycenæ to last 3,000 years; that raised the fragile coil of pipes that has crowned S. Vitale for thirteen centuries; and that spanned the Pantheon with a dome not yet surpassed!

But of all the thousand pilgrims who gaze delighted on these works, how few give a thought to their authors! They were of us—proud may we be to say it—and well could I wish that the glance of modern scrutiny, that has searched so deeply into the cloudy past, could open out to us the names and history of its guiding spirits, and let us know somewhat of the workings of our brethren of old, who have left behind them only their great works—

"Footprints on the shores of time."

At the request of Mr. Bunning, V.P., Chairman, Mr. Carpenter, Visitor, gave some explanation of an interesting set of drawings made by him representing temples and buildings in Kashmir and Northern India. The roofs, pyramidal externally and domical inside, were formed of two solid blocks of stone, the internal dimensions 15 to 16 feet square. No scaffolding appeared to have been used in raising some of these structures, the materials having been moved up the incline of a mound of earth, which was gradually increased as the work proceeded, and the building, when finished, was enclosed by it on all sides till it was removed. An example was still to be seen with the materials resting on the mound, the works never having been completed. Full particulars of these temples would be found in a paper by Major Cunningham, in the Journal of the Asiatic Society, 1848.

Mr. G. G. Scott, V.P., said that the introduction of the dome into Gothic works had been considered a great desideratum. From his own studies and attempts to effect it, he should say that the dome suited the Gothic as well as any other style of architecture—the great difficulty, however, was to make it harmonize with the high pitched roof. In the abstract, it seemed that the dome could not be made to afford a satisfactory result both in internal and external appearance, as in whichever particular it succeeded, it would appear on the other either too high or too low. Perhaps the Byzantine dome of Sta. Sophia might be considered the correct one for inside effect, but its external appearance was flat and unsatisfactory. If raised up to tell externally, the inside effect would be injured, besides the additional expense of the costly stone work. To introduce the dome in Gothic architecture effectively, we must endeavour to overcome the difficulty occasioned by the transepts and high roofs abutting against it. It was not to be expected that the use of the dome could become general, as the great cost would be an obstacle; still, attention should be paid to it, in order to introduce, where feasible, so magnificent a feature both in the interior and exterior of buildings. In civil buildings a perfect interior might be obtained in the dome, and in buildings detached or without wings a happy result both internally and externally might generally be looked for; thus the whole elevation of the Baptistery at Florence was satisfactory and the interior effect very fine; but in the Baptistery at Pisa, though the exterior shewed a domical form, the interior presented a mere cone.

Mr. Edwin Nash, Associate, said that the fashion for building domes seemed to have been set by that of the Pantheon at Rome, the earliest and still the best, both internally and externally. The other Roman examples of Minerva Medica, Vesta, the Mausoleum of Augustus, &c. seemed to have been constructed within a few years of the Pantheon and during the Augustine age, shewing how soon the example had been followed. In point of construction the dome was one of the easiest in architec-

ture, particularly when raised on a circular substructure as at the Pantheon. The modern contrivances to lighten the mass of material, as the hollow pots used by Sir John Soane at the Bank of England, &c. appeared to him unnecessary—so simple was the operation in itself as to require none of those appliances. A discussion on the construction of domes would be highly interesting.

Mr. M. Digby Wyatt, Hon. Sec., alluded to the dome proposed to be constructed with wrought iron, 200 feet in diameter, for the Exhibition Building in 1851; and Mr. Lewis gave some detailed explanation of a very large working drawing of the iron ribs and standards used by Mr. S. Smirke in the new circular reading room of the British Museum, 140 feet in diameter and 105 high internally. Mr. Digby Wyatt observed that in Eastern domes the use internally of geometrical figures, diminishing upwards as the space contracted, was more satisfactory than the hacknied repetition with us of the monotonous vertical rib. To meet the difficulty, mentioned by Mr. Scott, of ensuring a good appearance both inside and out, perhaps colour applied internally might be found a valuable assistant, when the exterior had been constructed of the most satisfactory form. But under no circumstances should the decoration, of whatever description, be such as to interfere with the grand feature of curvilinear outline in the dome.

Mr. Scott agreed that airiness of effect might be obtained by the proper use of colour. But in decorating the interior of domes, as of other structures, the treatment should be of a flat and uniform style, so as not to disturb the structural form of the dome itself.

Mr. Papworth, Fellow, could not refrain from vindicating the architect of the Four Courts, Dublin, from the strictures passed on that work, which was but a faithful transcript, so far as the domical covering was concerned, of the much admired Pantheon of Agrippa. With reference to the charge brought against many domical buildings, of much space being wasted between the visible interior and exterior, the same objection might be alleged against Mediæval spires, the whole interior of which was often invisible, generally even to the bell-ringers. Examples were put forth in Mr. Lewis' paper as domes, which he held to be improperly so denominated—vonssoirs radiating to a common centre throughout, and not simply concentric horizontal rings being the vaulting essential to the constitution of a cupola, or a dome Inattention to this particular, and trusting to the mere force of cohesion of the cementing material employed in the construction had probably led to many failures in Indian domes of recent date, which English engineers had been called in to rectify.

Mr. Lewis explained that his remarks on the dome of the Four Courts, Dublin, were directed not so much against the domical covering itself, as against its obvious want of harmony with the leading vertical outlines of the very lofty tambour on which it was placed.

Mr. C. H. Smith, C. Visitor, believed that the dome at Florence was hardly inferior in size and arrangement to the Pantheon at Rome; and he considered the complicated mode of construction shewn on the drawing of the latter building, in which the thrust was merely transferred from one small arch to another, and ultimately to certain parts at the base, the dome being 5 to 6 feet in its least thickness, as inferior in scientific skill to that shown in the section of St. Paul's, in which the brick cone supporting the lantern crowning the whole was only 18 inches thick. The so-called loss of space in that dome he considered essential to the good effect of the whole building, viewed externally as well as internally. The iron construction which had been alluded to, might he believed be extended to domes of much greater span—even to 500 feet. Telford the Engineer had been taunted for projecting the suspension bridge over the Menai Strait of 560 feet span, but the result proved the correctness of his views, and bore out his playful observation that a loaded waggon would produce no more effect on the bridge than a fly settling on a tape yard measure stretched horizontally.

Mr. E. Nash, notwithstanding Mr. Papworth's dictum, thought that a dome might be constructed of horizontal rings without any centering, at any rate for more than one half its height from the springing.

A Member alluded, in support of this opinion, to the arch constructed without centering by Sir M. Brunel.

Mr. Ashpitel, Fellow, thought that domes were used and understood at an earlier period than had generally been supposed. That the Odeum at Athens was so covered, might be inferred from passages in Greek authors. Cratinus compared the roof of the building to the peculiarly shaped cranium of Pericles. The word Tholos, used by Homer, referred probably to the whole of a building; and Vitruvius, as a Latin author, did not explain the meaning. In the Pantheon a novel mode of construction first became apparent, viz., converging ribs of brick, the spaces between filled in with lighter material. The same still remained in skeleton in the ruins of Minerva Medica, a proof of its strength and durability. And these were prototypes of the great iron construction, recently carried out at the British Museum and the Coal Exchange. The Hindostanic domes would seem on the contrary to be built in horizontal courses, but that construction presented the obvious disadvantage of requiring an immense mass at the springing to counterbalance the leverage of the upper part. Though the earliest Roman domes exhibited the rib and panel system of construction, later ones were formed of continuous masses of masonry. The question of thrust was one requiring attentive consideration, and Brunelleschi, at Florence, had displayed great skill in making the covering cellular, and so of two thicknesses, by which he had consequently obtained great comparative lightness, and freedom from crushing at the base. Like the dome at Florence, that of St. Peter's at Rome was a real one of construction both inside and out; but though St. Paul's and the French examples differed from them in this respect, and in the space apparently lost between the interior and exterior surfaces, the right to employ certain artistic licenses in design must not be denied to the authors of the last named buildings. Mr. Ashpitel proceeded to give an account of the present dilapidated state of Palladio's celebrated Villa Capri, the main feature of which, the dome, was executed in a manner different from and inferior to that shown in the engraved views of the building. The theory of the construction, thrust, equipoise, &c. of the dome, differed essentially from that of the ordinary vault and arch, and the whole subject still demanded careful scientific investigation.

Mr. Papworth remarked that Mr. Lewis Vulliamy had introduced a mode of lighting a dome in Mr. Holford's House in Park Lane by numerous openings in the surface, besides the central eye, which Mr. Vulliamy considered would produce a very satisfactory result.

Mr. Charles Fowler, jun., Associate, repeated a remark of his former instructor, the late M. de Chateauneuf, that domes should be lighted from below, and not from a central eye. This he considered applied most correctly to those decorated like Sta. Sophia, with coloured mosaics, which would be indistinct if lighted from above. The charge of untruthfulness made against the use of several domical vaults, placed one over the other, in some modern examples, he considered unjust, as they all were seen to the extent required, and so fulfilled the respective purposes for which they were obviously constructed.

A vote of thanks was passed to Mr. Lewis for his paper, a development of which, embracing the theory of the construction of domes, the Chairman invited him to supply at a future meeting.

A SHORT NOTICE ON STAMPED OR INCISED STUCCO,

Communicated to the Ordinary General Meeting of the Royal Institute of British Architects, June 15th, 1857,

By B. Ferrey, Fellow.

I wish to call the attention of the members to some specimens of stamped Stucco, from which I think it may be seen that it is possible to obtain large surface decorations at a small expense, and that a common material, which has hitherto in modern practice been only used for perfectly plain purposes, may be made the means of much successful enrichment. My mind was first directed to this matter by a desire to obtain some sort of suitable ornamentation for the interior of churches built at small outlay; for it appeared to me that when every effort was making to render churches both solid in construction and beautiful in material, by the use of costly marbles for walls and polychromatic devices for internal wall surfaces, there should be some attempt (where economy in cost was obligatory) to employ common products in such manner that in their natural use they should conduce to church-like effect, without adopting those surface embellishments which, in their application, become necessarily expensive.

Much attention has properly been given to a better use of bricks for Ecclesiastical buildings, and good effect has been produced by them with stone and flint; naked brickwork, however, for the internal facing of walls is less successful, and the usual way of obtaining durable surface decorations is by painting upon metal plates and affixing them to the walls. With many people, however, there is a strong dislike to polychromy. They will sanction any extent of neutral tint or bi-colour, but object to having coloured decorations, however well executed. This may be, and probably is, a mistaken view; but the prevalence of the opinion is a "great fact," and must be dealt with accordingly. Any kind of enrichment, therefore, which can be produced in the plaster, and is consistent with "true principles of Mediæval art," is worthy of notice. Anything affecting to be what in reality it is not should be excluded from use in churches, where truthfulness ought to prevail. Plaster is therefore very properly forbidden to be used for columns and arches, or any constructive members which ought to be of stone or some other rigid substance.

In former times the plastered walls of our churches were covered with coloured devices and texts, or illustrations of scriptural subjects; entirely plain surfaces were seldom to be found; but in later periods a Puritanical spirit prevailed, which led to the concealment of all these decorations by repeated coatings of whitewash. Happily a more enlightened feeling now exists, and there is a general desire that our churches should be suitably ornamented; indeed, nothing hinders decoration but the want of funds, and in all modern churches there is a seeking for some economical mode of enriching the internal wall surfaces. A very cheap and simple mode of ornamentation seems hitherto to have remained unattempted. It is well known that the external rough casting on old wooden buildings was stamped or wrought in small devices, known by the term "pargetting," but it never assumed the importance of extensive wall decorations, as when stone and brick entirely superseded the use of quartered oak framing the system of pargetting also ceased. There seems no reason, however, why this principle of design should not be largely used in another way. The plan now proposed is to impress the common stucco with geometrical and other forms,—they may be applied according to the taste of the architect, either under string-courses, around arches in spandrils, soffites, or in large masses of diapering, and texts may be imprinted on the plaster instead of being simply painted on the

walls. If colour is desired, it can be effected by mixing the desired colour with the coat forming the groundwork, then by laying the stencilled pattern against it, and filling in the solid portions of the device with the ordinary stucco or plaster.

It will be observed that I have used the word stucco in this description and not plaster; it is not, however, to be supposed that this process cannot be used with fine plaster or any cement which does not set too rapidly. My object is to show that the commonest material is capable of being employed, and that it may be impressed "in situ." If common stucco, therefore, may be thus treated, it shows what opportunities are open to us for giving interest to large wall surfaces which are generally left plain.

My bringing this matter before the members of the Institute is simply with a suggestive view; each person will judge for himself as to the particular way in which it may be applied. The cost of making the brass patterns is not expensive, and there is no reason why fresh designs should not be made to suit any building,—thus the frequent repetition of the same ornaments would be avoided. This should not aim at superseding any higher mode of decoration; but that it may be made conducive to good effect in the interior of buildings, I can entertain no doubt.

A SHORT ACCOUNT OF SCOTT'S PATENT CEMENT,

Communicated by Capt. H. Y. D. Scott, R.E., June 15th, 1857.

Whilst experimenting, in the spring of 1854, on a lime possessing feeble hydraulic properties, I, on one occasion, placed a piece of the limestone in a dining room fire, and then left it for a few hours to calcine it. In the meantime some economically disposed person smothered the fire with cinders and dust from the hearth, and on my testing the lime with acid to ascertain if it was properly burned, it effervesced so violently that I again returned it to the grate. But, now, the fire could not be made to burn brightly, and on a second trial it effervesced as much as before. Somewhat impatiently I rubbed the lime to a powder, to assist the slaking, mixed it with water, and waited in expectation of seeing the cake I had made crumble to powder, but, much to my astonishment, it gradually solidified, and at the end of twenty-four hours would not yield under the nail.

After many attempts, with coke and coal to produce similar results on a manufacturing scale, I ascertained that the phenomenon was, in some manner or other, caused by the sulphurous acid generated from the fuel, and this led to the process now adopted.

This process consists in subjecting quick lime, which has been raised to incipient redness by the combustion of ordinary fuel, to the fumes arising from sulphur burned with a limited access of air. A small amount of sulphate of lime is thus formed, and to this cause, apparently, the extraordinary change produced in the lime is to be attributed. It now no longer slakes, in the ordinary sense of the term, and when ground to powder and used as a cement, it not only forms a very cementitious mortar, but affords a very cheap, beautiful, and durable coating for walls, whether used internally or externally.

The ordinary method of coating walls internally is open to many objections.—

1. Lime and hair plaster often blisters from the use of imperfectly slaked lime.
2. It always opens in unseemly cracks from unequal contraction in drying.
3. A long period, varying with the season of the year, must elapse between the application of the several coatings, involving serious loss of time and inconvenience in moving scaffolding.

4. A very long period must be allowed before the walls are papered and painted.
5. It never becomes sufficiently hard to resist a moderately heavy blow, such as may be given in moving furniture, &c.

From all these objections the new cement is free. It neither blisters nor cracks. It sets with sufficient rapidity to allow the plasterer to follow on with the finishing coat without loss of time, and therefore the expense of moving scaffolding is avoided.

A room can be papered and painted as soon as finished, excepting in the winter time, and then as soon as the walls can be made sufficiently warm to prevent the deposition on them of the moisture of the atmosphere.

And to all these advantages is to be added that of costing, if laid on half an inch thick, 20 per cent. less than the ordinary material.

For exterior coatings, the Portland cement is now generally used, and if well made and properly treated, this cement leaves nothing to be desired in point of hardness. But objection is constantly made to the great variations in its colour, and, indeed, it is impossible to get two supplies, or even two casks, of precisely the same tint. Very frequently, one portion of a house shows of a blueish white, and the remainder, by a well marked line of separation, of a leaden blue or dirty brown. Scott's cement, on the other hand, is always of the same colour,—the agreeable light buff of the magnesian lime stone,—and any variation of tint that shows itself after application is of a nature to increase its resemblance to it. At the same time, at the expiration of a week, it can compete with the Portland cement in hardness, and the saving effected in the materials used in stucco work is not less than 30 per cent.

The only precaution necessary to impress on workmen in its use is that which is necessary with all cements, and the neglect of which so frequently brings undeserved expense and abuse on the cement manufacturer. I mean a thoroughly wetted wall for the rendering coat, and still more a thoroughly wetted rendering coat (if the setting coat is not brought on at once, as it should be) for the finishing work. A cement cannot set properly if the water necessary for its solidification is strained from it before the chemical action with the water is complete.

In summer time I would further recommend that, two days after the coating has been applied, the finished wall should be again wetted with a syringe or watering pot—an operation requiring a few moments only—but greatly assisting the due action of the cement.

Mr. Henry Baker, Fellow, said he believed that Scott's Cement had been used at the houses in Tottenham Court Road, which fell down a short time since, where the cement used was certainly very bad indeed. The builder had shown him the invoice, in which it appeared as Scott's Cement.

Mr. Digby Wyatt, H.S., said that he had lately met the Commanding Engineer Officer at Chatham, who had spoken in high terms of Scott's Cement.

Mr. Baker said that, if cheapness was the characteristic of the cement, the builders of the metropolis would of course avail themselves of it.

Captain Scott, Visitor, believed that some mistake had been made with regard to the houses in Tottenham Court Road, where he had heard since the accident that Roman cement had been used in the parts which failed. His own cement had also been used in the building, but whether properly mixed he was not then prepared to state. All cements were exposed to the risk of failure from improper or unskilful treatment by the workmen. But his cement had been tried at Chatham with great care by Captain Schaw. The results of the experiments would be published, but he might perhaps be permitted to read a few extracts from them.

Captain Scott then read a

STATEMENT OF COMPARATIVE COHESIVENESS OF VARIOUS CEMENTS AND MORTARS AFTER ELEVEN DAYS.

	lbs. per square inch.
Scott's, with 3 of sand (mean of four experiments)	41.15
Pasley's, pure	33.4
Francis', pure	30.2
Scott's, with 6 of sand (mean of five experiments)	29.9
Pasley's, with 1 of sand	22.7
Francis', with 1 of sand	21.5
Portland, with 6 of sand	18.28
Blue Lias, with 2 of sand	12.34
Halling Lime, with 3 of sand	8.27
Chalk Lime, with 3 of sand	7.0
Ditto, after thirty years	8.25
Mean of six experiments	2.47
Cohesive strength of Bath stone	35.2
Ditto of Inferior Bricks	27.6

At the same time it must be allowed that Scott's Cement is far inferior to Portland Cement, when used either pure or with a small proportion of sand.

The strength of Scott's Cement and of the Portland (supplied by Messrs. White and Son) was determined by Captain Schaw, R.E. and Ensign Monscreiff, H.E.I.C.E.; the other results (being the highest given) are taken from Pasley's Works on Limes and Cements.

The price of Scott's, with 6 of sand, for 6 yards of mortar, is	40s. 6d.
„ Halling Lime, with 3 of sand	46s.

To return to the accident in Tottenham Court Road. Of course, when the houses fell down it was somebody's fault; and, as soon as one of the men found out that cheap cement was used, the fault was laid to the cement. He had taken his cement to Mr. Faraday, who had advised him to take out a patent. It could be applied as cheaply as common mortar, and it was harder than anything else that could be used.

In answer to an enquiry, how the breaking test had been applied, Captain Scott explained that Captain Schaw had placed the bricks endways together by their smallest surfaces, whereas General Pasley had put them together by their largest; consequently, the portion of the joint (as compared with the total surface) exposed to the atmosphere was much increased in Capt. Schaw's experiments, and the results were favourably stated as compared with those of Gen. Pasley. The bricks, when cemented together, were broken down by weights applied in a scale.

Mr. G. B. Williams, Fellow, mentioned an instance in which he had found Scott's Cement used, and at first he did not consider it better than common mortar, and had therefore stopped the work. He found, however, too much sand had been mixed with the cement. Having altered the proportions, he became convinced that the cement was very good, and he allowed it to be used.

Mr. W. W. Pocock, Fellow, said, that unless a large quantity of water was used, both mortar and cement would soon turn to powder. He had therefore encouraged the use of sand which had some mud or dirt in it, for the sake of the water; and he found much good to result from that course, because it furthered the chemical action of setting. The falling of the Brunswick Theatre was

attributed to the mortar—but he had a specimen of that mortar—and, on trying it recently, he found it was as hard as Portland stone—the chemical action having now had full time to take place.

Mr. C. H. Smith, Hon. Mem., said all cements were no doubt good as they came from the inventors, but when put into the hands of mere labourers, they had to encounter many prejudices, besides the difficulty of the workmen not being accustomed to them. It appeared to him that Captain Scott's Cement was a very excellent material, but if put into the hands of a common workman it would be very likely to fail. Such had been the case when Parker's—the so-called Roman Cement—was first introduced, many years ago.

Captain Scott said that his cement had been applied by a rough country labourer to 11 cottages near Maidstone, at 4½d. per yard, where the expense of ordinary plaster would have been 5d.

Further discussion on the subject was postponed, in order to proceed with the other business of the evening.*

The following letters have been received since this discussion took place.

Brompton Barracks, Chatham,
June 20*th*, 1857.

Gentlemen,

As you are aware, Mr. Baker condemned my Cement in strong terms at your meeting on Monday evening last; and, as I had not at that time seen the work in Tottenham Court Road to which he alluded, I could only reply by referring to different results elsewhere, and to the frequency with which cements, though excellent on leaving the hands of the manufacturer, are ruined by the improper treatment they receive from the builder.

Great was my surprise, however, on visiting the scene of the late accident, to find that all the walls executed in my cement, which are still standing, afford that refutation of Mr. Baker's statement of its worthlessness, which, at the meeting, I was unable to give.

I therefore called on Mr. Baker the following day, and begged him to accompany me to the spot—a request which he at once acceded to.

The result of the visit is the enclosed note, which I hope it may be in your power to append, together with this, to your notices of the meeting.

I should mention that, though I had not ventured to recommend more than three or four parts of sand, the builder (as he allows), in this instance, used six; and yet the cement is so strong, that Mr. Baker thinks (if I understood him rightly), from what he then saw in many parts of the building, that this quantity is no more than it could carry advantageously for ordinary brickwork.

I am, Gentlemen,
Your most obedient Servant,
HENRY SCOTT, Capt. R.E.

The Honorary Secretaries of the
Institute of British Architects.

11, Upper Gower Street, W.C.,
June 19*th*, 1857.

Dear Sir,

I have received, with thanks, the specimen of your Cement, and have perused the papers accompanying it.

I shall very soon give myself opportunities of trying its merits as concrete, mortar, and plastering, but shall take care to put the work into the hands of a respectable builder. When I spoke of it the other night at our Institute, I very incautiously adopted the error of Mr. Marsh Nelson, who, in his absurd report in re Tottenham Court Road, condemned the cement itself and the manufacturers of it, instead of the builder, who, for his own petty gain, both mixed and used it improperly, and quite spoiled an article which I now verily believe to be a good one.

I am, Dear Sir,
Yours faithfully,
(Signed) HENRY BAKER,
M.I.B.A.

Capt. Scott, R.E.

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* Specimens of Ferrey's Incised Stucco, made of Scott's Patent Cement, manufactured by Lee & Co., may be seen at the Rooms of the Institute, 16, Grosvenor Street.

SOME DESCRIPTION OF THE MECHANICAL SCAFFOLDING USED AT THE NEW PALACE AT WESTMINSTER, PARTICULARLY IN REFERENCE TO THE THREE MAIN TOWERS OF THE BUILDING,

By Charles Barry, Jun., Fellow.

Read at the Ordinary General Meeting of the Royal Institute of British Architects, June 15th, 1857.

It will probably have often been the case with architects engaged on extensive and difficult works or buildings of peculiar construction and purpose, to have to consider and devise particular arrangements in the shape of scaffolding, either with the hope of effecting some economy by diminishing labour, or to meet some emergencies attendant on the works themselves. When this has happened, it must have been a matter of very great interest to enquire how like difficulties had been met by others, and to examine the records of their trials for similar objects, and the results. But here much difficulty usually presents itself from the paucity of such records, which, unless under some unusual circumstances, are very seldom to be found. The reason is obvious. The main object proposed to himself by an architect is, the perfect realization of his conception in the building, and though as each successive stage or process necessary comes under his attention, it is considered very carefully with reference to its bearing on the whole work, yet when that is completed, the processes by which it has been effected—the tools used upon it, as I may say, are forgotten in the results. The scaffolding is cleared away with jealous care, as though to *prevent* any record of it remaining, while the structure stands to attest its claims to admiration for truth or beauty in future times. It will readily occur to all how these remarks apply to many of the great works of past ages—the pyramids—the temples and obelisks of Egypt—the massive walls of Jerusalem—the wonderful constructions at Baalbec—and in our own country, Stonehenge and other Druidical remains; all of which have excited universal interest and wonder, the huge masses of which they are composed having evidently required the exercise of no ordinary mechanical skill, and consequently many have been and are the ingenious theories explaining how they could have been carried out. Again, we should all be gratified by being informed how the Mediæval architects erected the marvellously lofty and delicate spires of Antwerp and Strasburg, in which it must evidently have been one part of the problem, that the scaffolding should be self-supporting and independent of the delicate work itself. It has therefore occurred to me that some interest might be attached to a short description of the various mechanical contrivances in the way of scaffolding, which have been employed in the execution of the works at the New Palace at Westminster. I have been also induced to draw up such a description by the hope that other Members of this Institute may contribute similar memoranda from their own experience to our general stock of interesting and useful information on *constructional* subjects. In this instance, moreover, I am prompted by feelings of affection and respect for my father, the architect of one of the mightiest edifices in Europe, who never can be induced to describe his own works, and by the desire that some record of them may nevertheless remain. To make good any omissions or deficiencies in my account, or in my own recollections of what has been effected, I am favoured by the attendance here this evening of my friends Mr. Meeson and Mr. Quarm. The former having been long my father's chief assistant in his office, and the latter having occupied a similar office of trust for many years as chief superintendent at the building, they have both been materially concerned in devising and carrying into effect the several bold and daring constructional contrivances which have been adopted, and which it will be my endeavor to explain.

The extent of the New Palace at Westminster—the necessity for its being carried out in portions —and the exigencies arising from constructing the new works, in many cases, where the old buildings they were to replace remained in daily use, led to curious contrivances of all sorts. But in attempting to recall them, I have met with the difficulties already alluded to, for few and but scanty records exist even at the present time. Although much anxious thought and contrivance have been required, the result has perhaps been a mere pencil drawing, or a verbal direction, illustrated at the moment with a piece of chalk on the nearest wall. And therefore, although from having been myself engaged for some years daily at the building I have a perfect recollection that several curious contrivances were devised, I have found it quite impossible to describe them intelligibly by diagrams. I must therefore rest contented with briefly alluding to some of them, and invite the attention of the meeting to a more detailed account of the scaffolding and hoisting machinery employed at the three main towers, of which more records do exist, and which I believe are quite peculiar in principle to this building.

In the year 1840, when the commencement of the superstructure was made with the river front, (the coffer dam and terrace wall having been completed) I may observe that, although the old fashioned kind of scaffolding of poles and ropes had in some instances been superseded by the so-called whole timber or framed scaffold, with its tram-way and crab engines aloft, yet the latter was uncommon, and had never been applied on an extensive scale, and its peculiar advantages and economy had consequently never been much tested. I believe I am correct in saying that the first, or one of the very first instances, of the use of whole timber and tram-way scaffold was by my father at the New Grammar School at Birmingham, in 1833. The elaborately decorative character of the face masonry at the New Palace made it necessary either to execute the finishing in situ, which is still nearly always the method abroad, or to employ a system of scaffolding, by means of which heavy worked blocks might be raised without any chance of injury, and adjusted in their places with the same precision and facility as a brick could be laid by hand. I will illustrate my meaning by remarking that in very many cases the stone to be raised weighed 4 or 5 tons, and had on its face carving or other work—the result of three months' labour in the workshop. It had therefore become a valuable work, worth careful handling, though of course had the face-work been done after the stone was fixed in the rough, much longer labour by far would have been necessary.

The principle of framed scaffolding in connection with tramways, either on it, under it, or both combined (on which the trucks with stone and the hoisting engines travelled), adopted in the River Front, was found so advantageous that in one form or another the same means have been used to meet all the subsequent requirements of more special portions of the work. For instance, when it was required to execute the internal decorative masonry of the lobby of the House of Commons, a scheme was devised by which one small traveller was made to act on all the four sides, by an ingenious arrangement for turning round the square corner at each angle, either with or without its load; so that a stone might be at once lifted from the banker on which it had been worked, and carried round suspended to be set in its proper place.

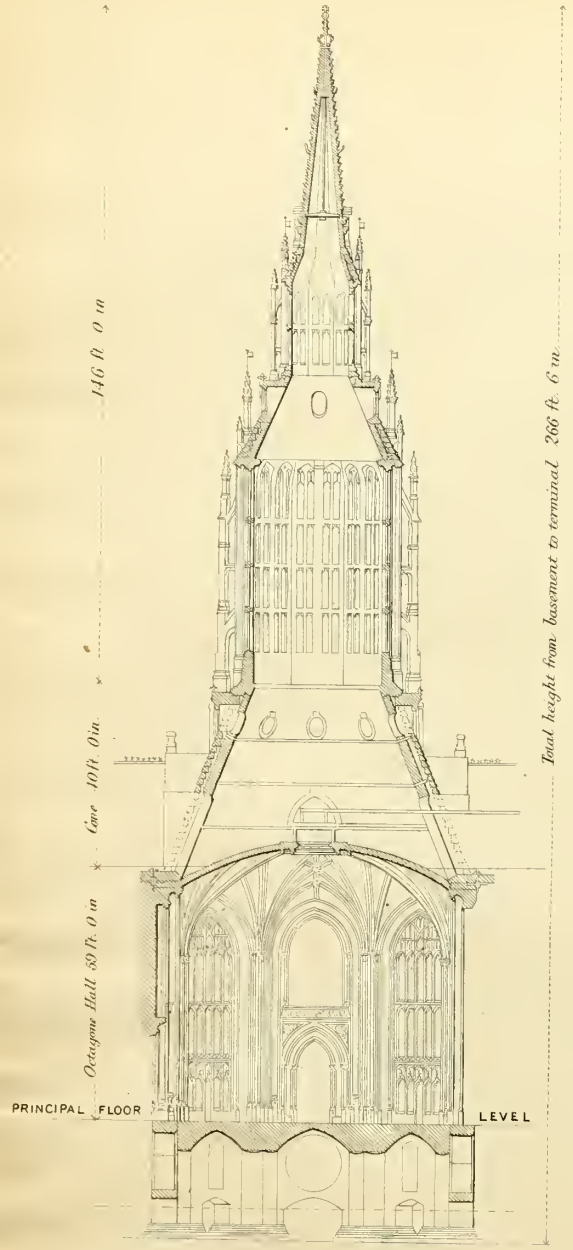
Again, when the internal masonry of the central octagonal hall was in hand, a circular single line of rails was laid down, just inside but clear of the walls, on which a pair of lofty framed legs like tressel shear legs travelled, connected with a centre pole, as a pivot, by means of a strongly braced and trussed timber frame at the top, on which again rails were fixed to receive the wheels of the travelling engine. (Diagram No. 2 at G G.) This framing and railway projected so far over, that the tracery heads of the large windows, the courses forming niches, and the springers of the vault could all be worked below with the utmost exactness, and dropped into their places with such certainty of the mouldings fitting, that the subsequent labour of cleaning off was always trifling, and often unnecessary.

I could wish that it were possible to exhibit also the centering of the large octogonal stone vaulting over the central hall, 55 feet in diameter. I well remember that it contained several novel and peculiar arrangements; one of which, I think, was, that all the stones for the vault were raised through an orifice in the exact centre of the centering itself, but I have been unable to find any drawing or details relating to it.

I will now invite attention to the means employed to raise and set the masonry and brickwork of the three great towers of the building, which differ very materally in their form and character, and therefore in their construction, commencing with the Central Tower, which was the first completed. I have already described generally the means used to build it up to the vaulting over the Central Hall. It will be seen that the central lantern is supported upon a cone starting from the springing of the vaulting; a powerful chain bond is here introdnced, by means of which the resolution of the entire weight of the stone lantern on to the base of this cone is effected, which of course adds to the seenrity of the groining itself. The cone, which was constructed of brickwork and afterwards cased with the stone tabling, was itself a work of some difficulty. The arrangements of the elaborate system of ventilation introduced into the building by Dr. Reid, which had refcrence to the central tower as the point of ultimate extraction of all the smoke and vitiated air, reqnired that very large orifices of communication with the surrounding roofs should be maintained throngh the base of the lantern, as well as into the lantern itself. It was therefore necessary to perforate the brick cone by large arched openings; the consequence was that the portions between them had to be built isolated from each other up to the spring of these openings, and were therefore obviously overhanging walls. As a second system of centering would have been very expensive, it was determined to attempt to build the cone by means of a trammel, only working round a centre pivot in such a manner that the inner snrface or interior should be kept true all round. Ties or chain bond of iron were introduced at the points shown, to prevent all chance of the work afterwards spreading outwards at the foot when subjected to pressure; and the whole was successfully and rapidly accomplished. The leaning portions, which looked very insecure to the unpractised eye, were duly connected by arches turned through the whole thickness of the wall, and connected with iron struts, as shown; the system of the trammel answered perfectly, and the brick cone or base for the stone lantern was completed (without the accidents confidently predicted by many) and, perfectly true in form and plan, was ready to receive the further works about the latter end of 1841.

I wonld here call attention to the diagram, (No. 1,) to point out that the cone was really rendered continuons on plan during its whole progress by means of temporary timber struts, introduced in the openings, which, in point of fact, acted as keys or horizontal vonssoirs; without these there would have been, of course, risk of the disconnected portions falling. These struts were left in till some time after the arches were turned over the openings, and the work had had time to set thoronghly; when they were removed, a minute examination conld not detect a trace of movement or flaw in any part of the work, nor is there any now under the load of the tower above it. The brickwork was executed in mortar, with occasional tiers of four or five courses in cement, within seven weeks from the commencement.

Up to this time all the materials had been raised internally throngh the central orifice in the stone groining; bnt it now became necessary to alter this mode of procceding, inasmuch as the finishings of the central hall, with other portions of the works adjacent, were required to be given up to render this part of the building available for public use. On the block plan of the building, the small court, called the Peer's inner court, will be seen. From this henceforth all materials were hoisted outside up to the level of the platform coinciding with the upper rim of the cone, and deposited on trucks running on a tramway extending over the roofs of the building to the centre of



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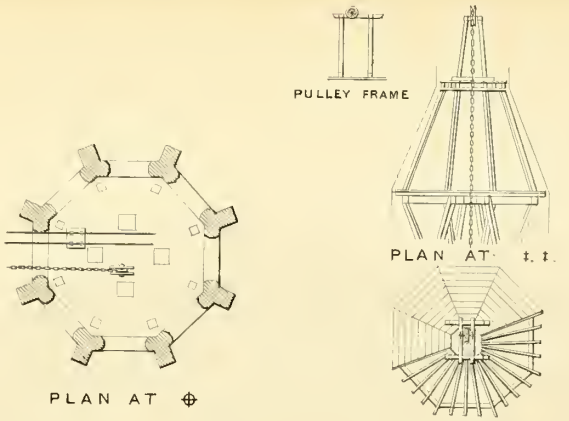
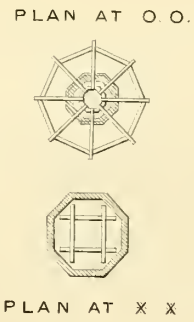
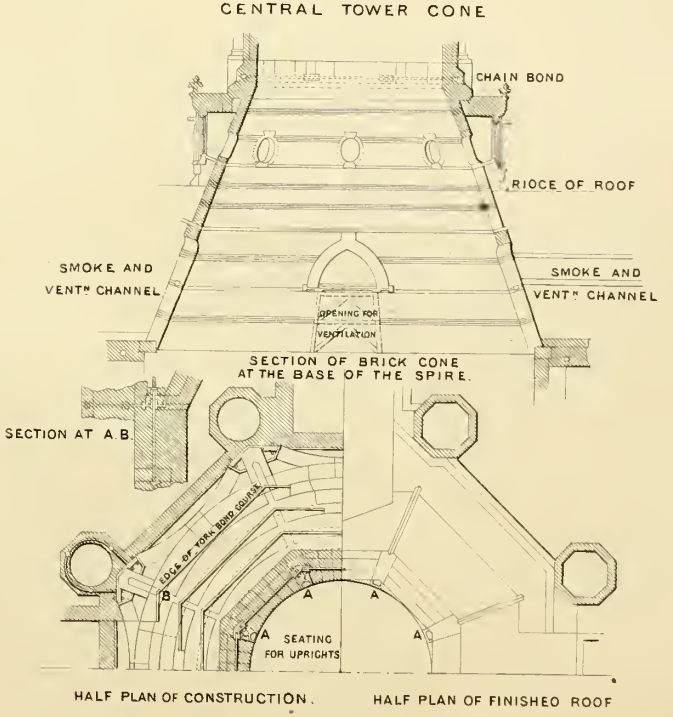
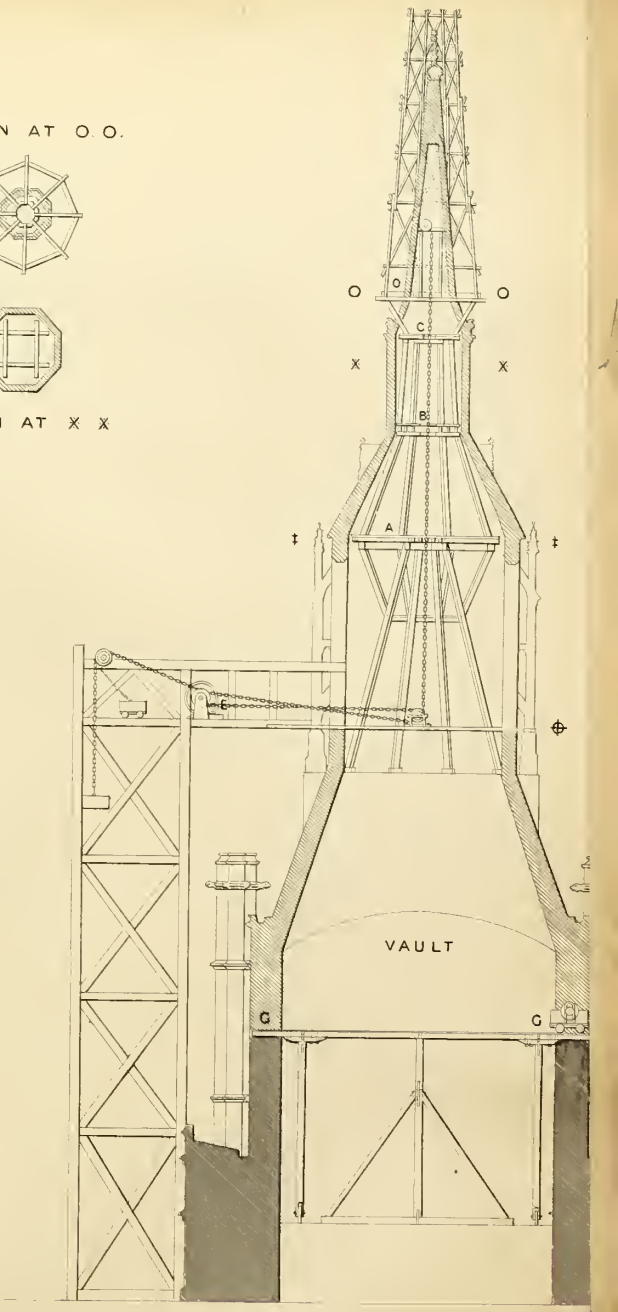






No 1.



No 2.

CENTRAL TOWER.

NEW PALACE AT WESTMINSTER.

Day & Son.

the platform over the cone: from this point upwards the lantern of the central tower was built by the system of framed scaffolding shown on the diagram. (No. 2.) This scaffold was put up and added to from time to time as the work proceeded,—first up to the point A on the top of the second tabling, then to B, C, D. Platforms were constructed at these various levels to receive the materials hoisted, as well as for the use of the masons; and the stone, being always raised in the centre through a shaft or ring left in the framing and platforms, was easily set by the workmen, without depending in the least degree on any part of the work already built: this was obviously a point of the utmost importance, arising from the delicate mullion work of the lantern windows. The raising of the materials from the ground to the lower platform or tramway was effected by connecting the small engine E with a drum and tackling immediately over the court below: the materials, having arrived at this height, were taken by trucks to the centre of the tower, when the same engine was connected with another set of tackling running over a pulley in a frame fixed about six feet higher than the next intended platform. Large stones were thus raised by two lifts from the ground to their final position, 150 to 200 feet or more, without handling in any way, and consequently without risk of injury. This arrangement was continued by simply shifting the pulley higher and higher, and lengthening the connecting gear between it and the engine drum, until the internal diameter of the spire became too small to receive it, when the platform was so framed as to extend outwards through the small lucarne lights in the base of the spire sufficiently to allow a scaffold of ordinary poles to be erected on it. All the remainder of the materials, including the metal terminal, was raised, as described, to this platform in the interior, and then run out through a temporary opening left for the purpose in the base of the spire itself. The same principle of keeping the scaffold clear of the work was continued; no putlogs whatever were used, but by disposing horizontal poles diagonally on plan, the whole was firmly braced from time to time. The engine used was a portable one, known as "Gough's patent," and its cost was under £100.; the scaffold cost about £500. more. I will hereafter give some interesting data respecting the economy which can be effected by the use of steam-engines for raising materials for towers and like structures, but before quitting the Central Tower, I may mention that its dimensions are as follows:—

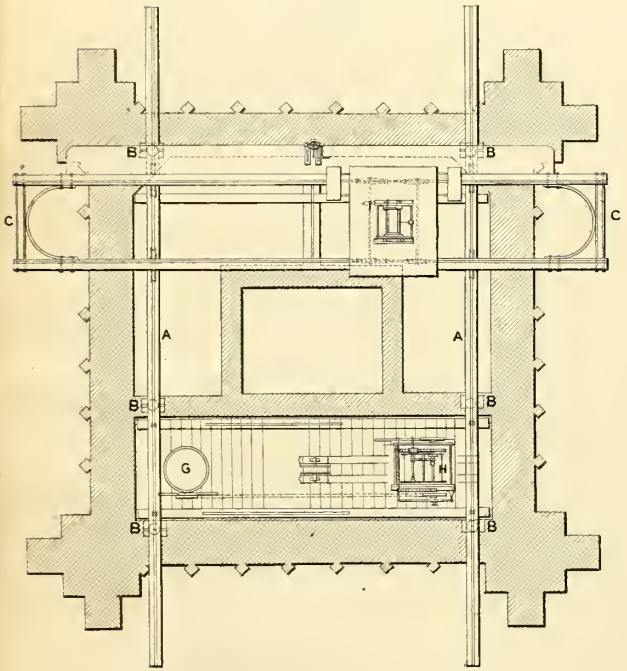
External diameter	70 ft.
Internal diameter of the octagon hall	55 „
Diameter at the base of the lantern	33 „
„ „ spire	11 „
Entire height from the basement level to the top of the spire .	266 „
Height of the octagon hall from its pavement to the vaulting .	59 „
The approximate number of cube feet of worked masonry above the cone, exclusive of brickwork	25,000 „

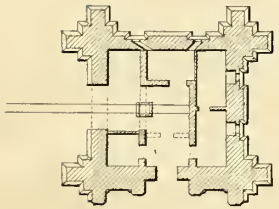
We now come to the Clock Tower, and I have in the outset to remark, that the principal peculiarity of the scaffolding used in this and in the Victoria Tower is, that it rose with the building; being, if I may so express it, self-raising and self-adjusting. The other great peculiarity of all the tower scaffolds consisted in the employment of steam power to hoist, the steam-engine being placed at the top, and close to its work, instead of at the bottom, where it would generally be fixed. In the erection of the Clock Tower the stone and other materials were raised *inside* from the ground to the summit, so that, there being no appearance externally of a scaffold or other contrivances, the tower seemed to grow, as it were, by some inherent vital power. From the plan it will be seen that there is in the interior a shaft, intended to be eventually occupied by the staircase and a lift-machine: advantage was taken of this shaft to raise all the materials by the machinery illustrated by the diagrams Nos. 5, 6 and 7.

Main bearing beams A A, framed of whole timbers 2 feet 3 inches deep, and 14 inches wide, bolted and strengthened, were stretched across the tower walls from east to west, and on them rails were laid turned up at each extremity. These bearers had points of support on six blocks of cast iron with screws B B, which could be raised at will, as hereafter described. A secondary frame of timber or traveller C C moved on the rails just mentioned from east to west, and on this second frame other rails were laid, on which the small travelling crab or jenny, used to set the stone, &c., moved. Means were provided to enable the man in charge of the crab to move it and himself along, with or without a load, by turning a windlass at D, having a bevel wheel in connection with the axles of the traveller, and similar means at D^1 enabled him to move also the main traveller C C, mentioned above. Thus every facility was provided for the worked stone being moved to any part of the tower walls *in suspension*, and without handling. A further contrivance was necessary, however, to raise it from the ground. To effect this, two strong queen trusses, the length of the shaft or chamber above alluded to, and separated as much as its width would allow, were *suspended* to the main bearers A A by means of wrought iron bolts $1\frac{3}{4}$ inch in diameter, passing through the uprights and sill pieces of the trusses, and through broad cast iron plates E E under the sills: 4-inch planking was then laid on the same sill pieces, having in it an aperture sufficiently large to allow the stone, &c., raised to pass through. Immediately over this aperture, and resting on the head of the trusses, was the pully F over which the chain tackling used passed to the ground. A portable steam-engine G, Gough's patent, of $2\frac{1}{2}$ horse power, was fixed on this platform at one extremity, with a driving band from its fly-wheel to a large drum H, about 3 ft. 6 ins. in diameter, at the other side of the platform, and round this drum the chain was coiled and uncoiled. From this description it will be readily seen that worked stone, bricks, sand, water, iron, &c. &c., were raised from the ground up to, and through the aperture in the platform. In the case of a block of stone, a small travelling truck K, in diagram No. 7, moving on rails laid on each side of the aperture, was run under the block, which would be deposited on it to allow the chain to be free for another descent; meanwhile the crab first described, having been brought over the block by means of the arrangements already detailed, would lift it and deposit it on the bed prepared for it on the tower walls. The small truck K would be run back to allow another stone to be raised through the aperture in the engine platform as before, and the setting would proceed with such rapidity that, to keep one setter at constant work at the top, forty men were constantly preparing stone at the bottom. It has been found in practice that, with an ordinary framed scaffold and traveller one man will require twenty-five masons preparing stone to keep him supplied, while, as just stated, by the use of the steam-engine, one man required forty to prepare stone for him. What would be the proportion when the old system of poles and ropes is used I have not ascertained, but it would probably prove as far behind the framed scaffold, with the traveller worked by hand, as that is behind the powers of a scaffold where steam power is made use of. It only remains to point out the very simple means of raising the whole of this platform, with its engine, crab, travelling tramways, &c., the weight of which altogether, without any materials upon it, was about sixteen tons.

It will be observed that the main bearers A A were long enough to bear from wall to wall. At the six points B B ordinary jack screws were placed, with solid large blocks of iron at the top and bottom of each, through the latter of which the screw could pass. A nut or collar worked on the screw, having sockets to receive the ends of the iron bars used to screw it up or down, which were used in the same way as capstan bars. Now, supposing the main bearers to be resting on the walls, as shown, the jack-screws, having their nuts screwed hard up to their heads, would be put in their places, the walls under those bearings being built up to their under sides. All six screws would then be worked simultaneously, and the whole arrangement, platform, engine and all, would be raised up at

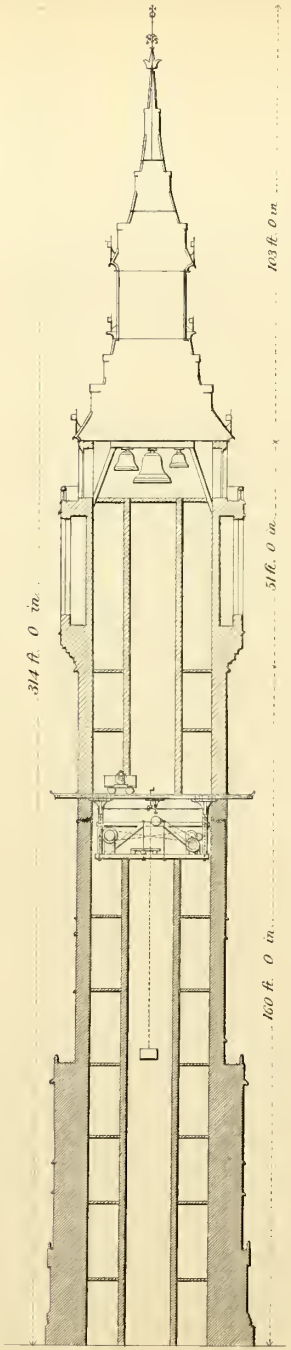
PLAN OF THE CLOCK TOWER.
TO A LARGE SCALE.





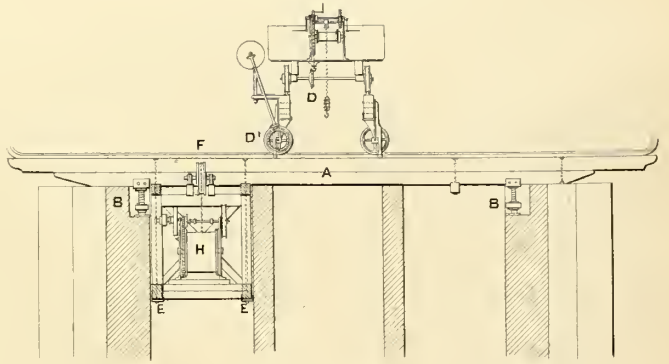
GROUND PLAN

No. 4.



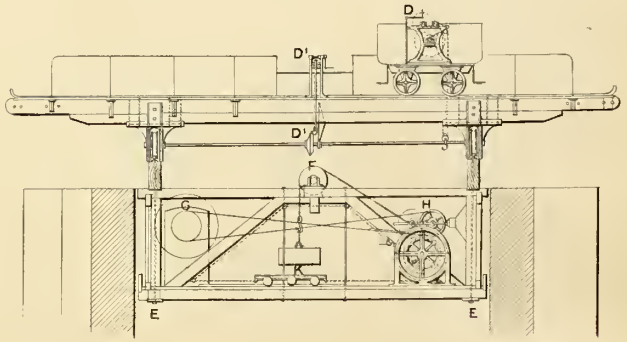
SECTION THRO' CLOCK TOWER.
No. 5.

SECTION THRO' CLOCK TOWER.
TO A LARGE SCALE.



No. 6.

SECTION THRO' CLOCK TOWER.



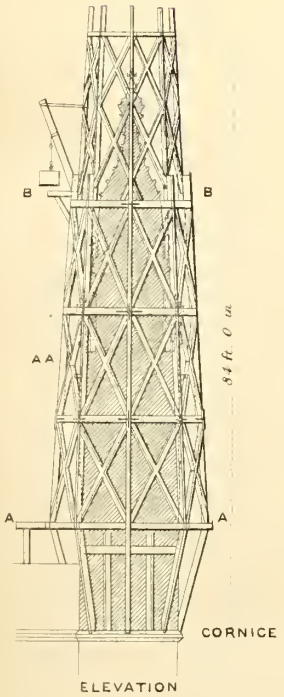
No. 7.

Day & Son Lith.rs to the Queen.

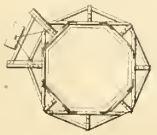
CLOCK TOWER.

NEW PALACE AT WESTMINSTER.

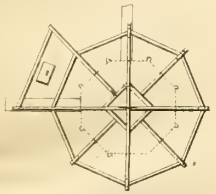
PLAN OF THE VICTORIA TOWER



ELEVATION

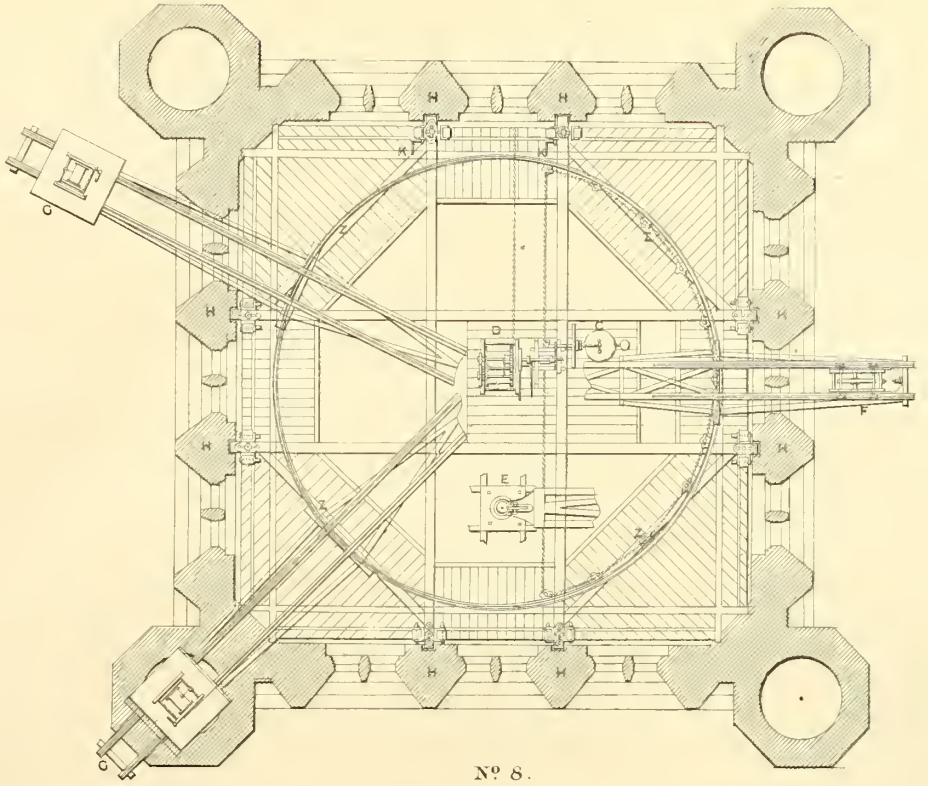


PLAN AT B B



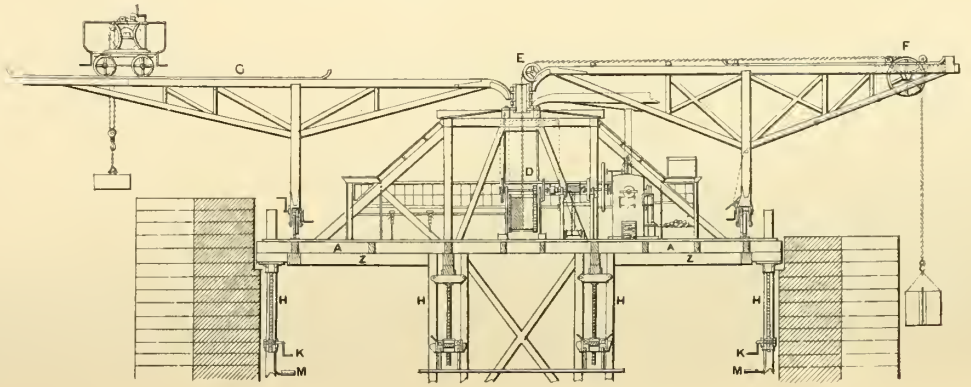
PLAN AT A A

Nº 10.

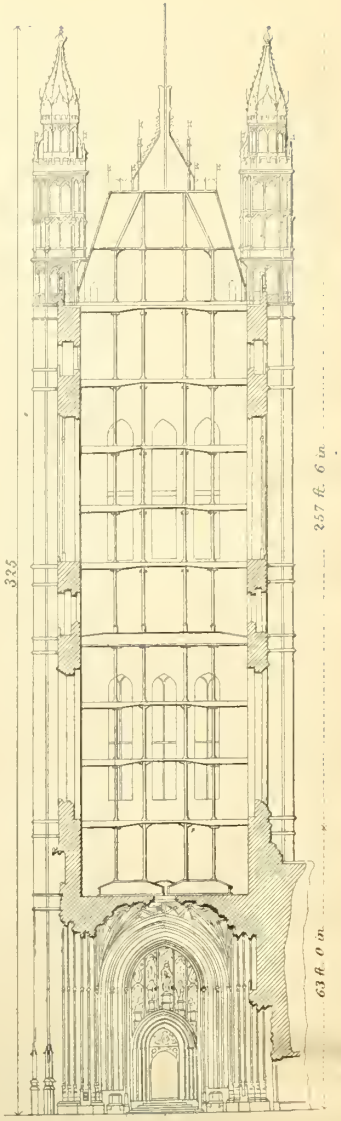


Nº 8.

SECTION THRO' THE VICTORIA TOWER



Nº 9.



VICTORIA TOWER

VICTORIA TOWER.

NEW PALACE AT WESTMINSTER.

Day & Son, Lith.rs to the Queen.

once about 3½ feet, that being the length of the screws. The travellers being then three feet clear of the tower, three feet more of the work all round could be set, and then a fresh lift would take place; though it is obvious that by blocking up the main bearers from the walls, two or more lifts of three feet each could take place before setting the masonry was resumed, when such a course was found in some cases to be more convenient. In this way the whole of the stone work of the Clock Tower was raised and set, and when that was finished, the same power raised the iron frame work, beams, and plates, of which the upper part and roofing is formed; but to fix which the simple scaffold of poles and ropes, cleverly braced, which still exists, was used.

The cost of the scaffold, with the engine and machinery, may be roughly stated at about £700. It raised about 30,000 cubic feet of stone, about 300 rods of brick-work, besides many tons of iron and other matters. It did all this so quickly and continuously, that there was no excuse for the workmen, either below or above, wasting time; while its manifest economy and precision of working need no further illustration. The dimensions of the Clock Tower are as follows:—

External dimensions on plan, average for the whole height . .	40 feet square.
Height to the cornice below the clock	160 „
Height thence to the top of the stonework	51 „
Height of the metal roof containing the bell chamber . .	103 „
Total height .	314 feet.

Before quitting the Clock Tower I may advert to the extraordinary reports a short time ago circulated, that it would be necessary to raise the great bell from the outside by means of a special scaffolding, at the cost of several thousand pounds, only to say that of course the subject had not been overlooked, as was charitably suggested, but that arrangements had been made from the commencement to enable a bell as large as was considered appropriate to be raised up the central shaft in the tower, and that at this moment all the appliances of tackling, crab, engine, &c., are prepared and waiting for the proper time to arrive, when there is no doubt that the bell will be raised with certainty to its permanent position in a single day.

VICTORIA TOWER.

At the Victoria Tower much the same principle of arrangement, as far as regards the position of the steam-engine and the rising frame work of the whole, was made use of, though the much larger dimensions of the structure caused some important differences. The internal diameter of the tower is 51 feet, and over to over of the turrets, 70 feet. In the first place, a strong trussed frame, over the whole area of the tower on plan, had to be constructed to carry all the machinery, and sufficiently stiff to bear being raised at once by the screw power without any racking or straining, and consequent disturbance in the position of the apparatus upon it. (See diagrams Nos. 8 and 9.) This framing consisted of single balks of timber, 51 feet long, and 14 inches square (very unusual specimens of timber); these beams or sole pieces AAAA crossed the area as shown, while similar pieces were placed all round close to the inside surface of the walls; diagonal braces at each corner Z Z tied all together on plan, and the four beams crossing the centre of the tower were strongly trussed, both above and below, the latter being necessary to resist the upward strain on the centre should all three travellers be possibly loaded at the same time. That the whole arrangement was thus rendered perfectly rigid and stiff, the experience of constant use for nine years has abundantly proved. A circular cast iron rail was next laid on the framed

platform, while part of the framing was covered with 2½ inch planking, and defended by a hand-rail for the safety of workmen, and on this at C the portable engine of six-horse power was placed, with its drum at D connected by gear work with the driving wheel of the engine. As the lower part of the Victoria Tower, which contains the royal entrance, is groined over with stone at the height of about 63 feet from the ground, the materials for building the upper part could not be raised inside, as at the Clock Tower, and the mode adopted, as shown in the diagram, was the result. An under trussed parallel framing or traveller was formed, moving round a hollow pivot in the centre of the tower E, and extending over and clear of the walls. The king posts of the under trusses were in fact framed tressels, or coupled shear legs, bolted together and strengthened so as to be perfectly rigid as if in one piece; each leg of these tressels had grooved wheels at the foot, which ran on the circular iron rail on the main platform first described, thus enabling the whole to radiate round the centre.

A pulley wheel, 4 feet in diameter, was attached to the framing at F clear of the outside of the tower walls, and a similar one was fixed over the orifice in the hollow centre pivot above referred to: over both of these the chain from the engine drum worked, and raised stone, bricks, sand, &c., from the ground, which were then deposited either on the walls or on the planked platform in the angles, and the chain was set free for another descent. There was also a contrivance, indicated in the diagram, to connect the hoisting traveller, when required, with the engine drum, and to move it and its load round on the circular tram rail to any spot on the top of the tower that might be most convenient for deposit at the moment.

To set the stone so raised, there were two other radiating framings or travellers G G formed in like manner, and also moving round the centre by wheels running on the circular tram-rail on the main framing. These travellers were of such a length as to extend to the outside of the angle turrets, and they could each command one half the area of the tower, working at the same time with the setter to each. On their upper beams rails were placed, on which the crab engine passed to and fro. It will be evident that by this arrangement every portion of the tower walls could be reached, and the stone raised by the hoisting machinery set down in the place prepared for it with the greatest nicety. To raise this huge platform, with its engine, radiating travellers, &c., weighing nearly forty tons, the following means were adopted, which proved perfectly successful to the end of the works. At the points H H H H, guide and bearing timbers were placed vertically, coupled together with bolt holes at intervals. These were scarfed and braced together, in heights of 12 feet, as required, and screws very carefully made, 3½ inches in diameter and 6 feet long, with solid head pieces to fit under and grip the timbers of the main platform, were placed between each pair of these guide posts. By means of a bevel pinion wheel with a winch handle K, working through a nut at their lower extremity, the large screws could be raised or lowered with ease and certainty, and with them the main platform, the ends of whose timbers rested, as will be seen, on the screw heads. This operation was carried on by lifts of 6 feet each, a man being placed at each screw on the platform M, (which being attached to the nut of the screw, rose as it rose,) and all turning simultaneously the whole mass was raised step by step, as required, up to and above the top of the tower parapet. It should be mentioned, that to provide against any serious accident, from disarrangement of the lifting screws for instance, slots or chases, 14 inches wide and 9 inches deep, were left in the walls of the tower at the ends of each of the main beams; these were carefully built up in cement as the scaffolding rose, so that the only time any fall could occur would be during the act of screwing up, when of course there would be no materials on the platform to add to the weight, and any such fall, had it occurred, would have been too limited to cause any injury.

No such accident, however, occurred, nor indeed has any happened to derange the machinery during the whole time that it has been in use.

The Victoria Tower scaffold has often had materials on it weighing 40 tons, which added to its own weight make 80 tons. The Clock Tower scaffold has frequently had to carry 30 tons of materials.

One very severe trial was experienced when the former tower was raised to the height of nearly 200 feet. The workmen, on leaving work, had omitted their usual custom of lashing one of the radiating travellers, to prevent the wind by any chance moving them. A hurricane arose during the night and lasted the following day, and a violent gust acting upon the radiating arms moved them round on the circular rail, and blew them together with terrific violence, as may be supposed, when it is mentioned that they were 50 feet in length. The report of the blow was heard at a great distance, and those engaged on the work fully anticipated that the framing must have been shattered; but when they ventured up to examine, as soon as the wind abated, it was most satisfactory to find that no trace of damage was to be seen, the whole arrangement having proved amply stiff and strong to resist the concussion.

Some calculations as to the cost of labour—the coals for the engine—repairs, &c. to the machinery may be interesting. They refer to the Victoria Tower and were the result of observations on a portion of it 60 feet in height.

In this portion there are about 18,800 cube feet of worked stone set, and about 57 rods of brickwork. Assuming the relative cost of the labour on the stone to be two-thirds of the whole, and that on the brickwork one-third, which supposition is probably nearly correct, it was found that wages and repairs cost, in all, £572. for the period during which the engine worked—equal to forty weeks—and taking two-thirds of this amount, or £496. as applicable to the stone, gives a cost of 6½d. per foot cube, and one-third as applicable to the brickwork, or £76., a cost per rod of 27s.

This amount does not of course include the first cost of the engine, which has sufficed, not for a height of 60 feet only, but for nearly the whole tower.* And when I state that the cost of this engine and tackling, with the hoisting apparatus, &c. was only about £1,800., and that there are about 117,000 cube feet of stone, 1,350 rods of brickwork, and 1,190 tons of iron in the tower, it will be seen that it is of no moment at all so long as its use materially diminishes the time of labour of the workmen.

The engine required the services of an engineer and an assistant; it was generally worked half a day or 5 hours, and consumed in that time about 3 cwt. of coal. It was calculated to raise 4 tons.

The time a stone (the weight immaterial) was in transit from the ground to the top of the tower, when 250 feet high, was 3½ minutes, including its deposit on the platforms above and detachment from the tackling.

All delays and hindrances included, the average number of lifts actually made per hour was ten, though in some cases as many as twelve and thirteen were accomplished.

The box used to contain materials other than stone, such as bricks, mortar, lime, sand, cement, &c. was so contrived that the bottom opened in two halves on releasing a lever handle at the side, so that the contents were at once deposited where required without the delay of emptying by hand.

The foregoing arrangements were continued with complete success in the erection of the Victoria Tower until a height of about 6 feet above the parapet was reached, which was as high as it was considered desirable to raise the engine and platforms. The pinnacles, 85 feet high from the cornice, were constructed by means of a cradling scaffold. The hoisting traveller remained as before, raising all the materials and depositing them on the platform at AA. The setting travellers were shortened so as to move round their pivot *within* the pinnacles, and they were then able to set all the stone work of the parapet between the pinnacles; and they still remain to assist in moving the iron work, &c. that is yet required for the roof.

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* The Steam engine was not used for the first 85 feet from the ground both of the Victoria and the Clock Towers.

The cradle scaffold for the pinnacles deserves some attention, being very daring in its construction, since it is entirely detached from and independent of the mason's work.

Its whole support is derived from a framed skeleton platform at AA, the timbers of which pass through the apertures in the eight sides of the pinnacles. (Diagram No. 10.) They are carefully bolted together and upheld at each angle by raking struts bearing upon the weathering of the string cornice of the tower. On this framework the braced scaffold was raised, being added to as required up to BB, with horizontal ties at each stage. The plan of the upper one B B shows the mode in which these horizontal courses were braced so as to leave the centre perfectly free for the pinnacle to rise within it.

Up to B B all the stone was raised *within* the pinnacle itself, being run into it on trucks at the level A A, and raised by tackling passing over a pulley at the top of the scaffold and connected with a crab engine at the base. Above the level B B, however, the pinnacle gathered in, and the stone was consequently raised outside from the platform A A by an ordinary tackle and fall; from this point upwards the scaffold is continued high above the cap stone of the turrets in order eventually to fix the crowns, with the exception of which and of the roof, the shell of the entire tower is now completed. This upper part of the pinnacle scaffold is formed with ordinary poles and ropes, but still keeping intact the principle that it is self-supporting and in no way resting on or touching the work. The scaffold poles look indeed little larger than wires from below; but this is hardly a matter for wonder when it is remembered that from the base of the tower to the top of the vanes is no less than 325 feet.

In concluding these memoranda, which I feel sensible are crude and imperfect, I can only hope that I may have directed the attention of my hearers to a subject which I am confident must be considered of interest to all architects, and very important to those who may be engaged in works of a more than ordinarily extensive and arduous kind.

I think they may also help to prove that architects are equal, when called upon, to devise and carry out works of construction requiring *originality and daring* as successfully as the members of the kindred profession of engineers. And I trust you will agree with me that I am justified in so characterising the works I have been describing.

In answer to questions from Mr. Digby Wyatt, Hon. Sec., Mr. Barry said that the builders had refused to undertake any responsibilty with regard to the tower scaffolding; and that therefore it was a matter of necessity that the architect should take that responsibility upon himself. The means of raising the materials as well as the scaffolding and machinery were provided by the Government; but this circumstance was taken into consideration in determining the contract scale of prices for the works. The architect was not paid extra for designing the scaffolding. He found himself expected to render that service as part of the work to which his fixed commission was applicable, although the builders would not have undertaken at the ordinary contract prices the handling and moving so much elaborately carved stone work, at the unusual altitudes required, without arrangements were provided them for hoisting and raising the materials, and to meet this requirement the scaffolding above described was designed and executed by the architect.

In answer to another enquiry as to the successive resting places of the main upright guide posts supporting the raising screws under the platform of the Victoria Tower,

Mr. Meeson, Visitor, referred to the drawings, and gave some further information as to the mode of raising the scaffolding from stage to stage, as facilities were presented by offsets in the walls

or by the iron bearers supporting the various floors in the tower—the numerous stories in which, would be occupied as depositories of parliamentary records.

Mr. Digby Wyatt further asked, whether there were any means provided to insure the stability of the travellers. They appeared to him to be very narrow in proportion to their length; so that, some means would be required to steady them in the event of a strong wind acting on them.

Mr. Meeson explained the peculiar construction of these machines, and the precautions adopted to prevent any difficulty arising from that cause.

Mr. Digby Wyatt said the importance of Mr. Barry's communication must be apparent, and they must all feel very much indebted to him for the interesting information he had given; which, indeed, must make them the more regret that Sir Charles Barry should have allowed some of the valuable details to escape record altogether. They could all understand how interesting it would be to have similar accounts of the contrivances adopted in erecting the great monuments of antiquity. They well knew the old crane at the top of Cologne Cathedral, by which the materials for that structure had been raised, upon a principle similar to that adopted by Sir Charles Barry. But with regard to Strasbourg and some other cathedrals, whatever mode was used, raising the materials, without straining the work, must have been a matter of great difficulty.

Mr. Donaldson, H.S.F.C., expressed a hope that copies of the interesting details and drawings which Mr. Barry had brought before the Institute, would accompany the printed paper which would be sent to the Members.* He fully concurred in admiring the ingenuity of Sir Charles Barry's mechanical contrivances. The ascent of the Victoria Tower could be accomplished with the greatest facility, and he had very lately gone up with Sir Charles Barry, who had explained the construction of it to him. He hoped that Mr. Barry would give the Institute, at some future time, an explanation of the scientific construction of that Tower, and especially of the iron-work supporting the floors of the record rooms, and the lofty roof. Intended as that tower was for the future storehouse of the Records of Parliament, it would be a useful lesson to the members of the Institute, whether young or old, to have the numerous ingenious details of its construction recorded; and he hoped that, during the recess, Mr. Barry would be able to prepare a continuation of his most able, ingenious, and interesting paper.

Mr. Barry said he could hardly then promise to do so, as the attempt must necessarily require much time and involve great labour. The Institute, however, would be glad to know that he had induced his friend, Mr. Meeson, if called upon next Session, to give a description of the very peculiar iron beam construction adopted in the Palace at Westminster.

Mr. Digby Wyatt added, that Mr. Edward Barry had also promised to give a more general description of the building.

The cordial thanks of the Meeting were then given, with much applause, to Mr. Charles Barry.

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* The lithographic illustrations which accompany this paper were copied on a reduced scale, by means of photography, from Mr. Barry's original drawings.

APPENDIX.

PENNETHORNE TESTIMONIAL.

NARRATIVE OF THE PROCEEDINGS

CONNECTED WITH THE PRESENTATION

OF

A GOLD MEDAL

TO

JAMES PENNETHORNE, ESQ. ARCHITECT, F.I.B.A.

Architect and Surveyor of H. M. Parks, Palaces and Public Buildings,

BY HIS PROFESSIONAL BRETHREN,

ON HIS COMPLETION OF SOMERSET HOUSE.

London, May 1857.

Mr. PENNETHORNE received in June 1856 the Address with which the following statement commences. From various accidents, that occurred during the execution of the dies of the Chambers Medal, Mr. Benjamin Wyon was not in a condition to produce a perfect impression until May, 1857, when the dies were completed, and a very fine Medal was the result of Mr. Wyon's taste and skill. As the Royal Institute of British Architects were then about to present their annual Medals, the Council of that body kindly yielded to the wishes of the promoters of this Testimonial, and allowed the presentation of the Medal to Mr. Pennethorne to take place on the same occasion, when Earl de Grey, the President, was in the chair.

TO JAMES PENNETHORNE, ESQ. M.I.B.A., ARCHITECT AND SURVEYOR OF HER MAJESTY'S PARKS, PALACES AND PUBLIC BUILDINGS.

London, 1*st July*, 1856.

Dear Sir,

Your Professional Brethren are anxious to congratulate you on the successful completion of your design for the Western Wing to Somerset House; in which, at the same time that you have adhered to the taste and style of the original edifice, and have done full justice to the genius of Chambers, you have adapted these additions to a difficult site with great propriety, and thereby produced a striking Architectural feature in the entrance to London by Waterloo Bridge.

We avail ourselves of this opportunity to express our sense of the ability, with which you have treated various other Public Buildings, which you have been called upon to erect as an officer of the Crown, and with which you have carried out the Metropolitan Improvements confided to your management.

During a long professional career many of us have had occasion to transact public business with you in your official capacity: on every occasion we have experienced from you the readiest access, as also the greatest courtesy and frankness. While every application has been met with all the facility, that your office could afford, we have had to recognise the skill and intelligence, which you have habitually brought to bear upon complicated and difficult questions of a technical nature, and the most anxious attention to protect the public interests in the very extensive purchases of property entrusted to your care.

Impressed with these feelings, we desire to offer you a mark of our cordial respect for your character as an Architect and Surveyor, and for your bearing as a Gentleman: and understanding that the "Art Union of London" have in preparation a Medal of Sir W. Chambers, with a representation of the Strand

Front of Somerset House on the reverse, we have applied to the Council of that body, and have received their consent to have an impression *struck in gold*, which, as soon as executed, we shall request you to accept, as a mark of the kindly feelings of regard borne to you personally by your Professional Brethren.

SAM$^{L.}$ ANGELL.
THO$^{S.}$ BELLAMY.
WILLIAM TITE.
SYDNEY SMIRKE, A.R.A.
CHARLES BARRY, R.A.
THO$^{S.}$ HENRY WYATT.
GEORGE POWNALL.
EDWARD I'ANSON.
CHARLES MAYHEW.
H. MAWLEY.
GEO. MAIR.
EDW$^{D.}$ C. HAKEWILL.
CHARLES BARRY, JUN.
CHARLES CHARNOCK NELSON.
WILLIAM SNOOKE.
JOHN HAMMOCK.
HENRY CLUTTON.
FRED$^{K.}$ MARRABLE.
W. J. GARDINER.
AMBROSE POYNTER.
J. H. GOOD, JUN.
JAMES HOWELL.
GEORGE SMITH.
SAMUEL BEACHCROFT.
HARRY OLIVER.
GEO. B. WILLIAMS.
SANCTON WOOD.
HENRY CLUTTON, 9, Whitehall Place.
JAMES BELL.
T. H. LEWIS.
J. J. SCOLES.
TALBOT BURY.
W. J. BOOTH.
MARTIN JOSEPH STUTELY.
J. H. GOOD, Ch. Commiss$^{r.}$
CHARLES PARKER.
ARTHUR ASHPITEL.
JOHN COLE.
PHILIP HARDWICK, R.A.
C. R. COCKERELL, R.A.
A. SALVIN.
JOHN SHAW.
JOHN HENRY HAKEWILL.
GEO. GODWIN.
OWEN JONES.
HENRY BAKER.
M. DIGBY WYATT.
ANDREW MOSELEY.
JOHN GIBSON.
JOHN DAVIES.
DEC$^{S.}$ BURTON.
H. E. KENDALL.
HENRY HARRISON.
P. C. HARDWICK.
BENJ$^{N.}$ FERREY.
W$^{M.}$ RAILTON.
HENRY GARLING.
ROBERT HESKETH.
EDWARD M. FOXHALL.
GEO. GUTCH.
CHARLES BEACHCROFT.
THO$^{S.}$ L. DONALDSON.
JAMES THO$^{S.}$ KNOWLES.
CHA$^{S.}$ FOWLER.
WILLIAM HOSKING.
WILLIAM MOSELEY.
W$^{M.}$ G. HABERSHON.
EDW$^{D.}$ HABERSHON.
FRANCIS EDWARDS.
DAVID MOCATTA.
EWAN CHRISTIAN.

The following names were forwarded after Mr. PENNETHORNE had received the above Testimonial.

DAVID BRANDON. C. F. OLDFIELD. T. ROGER SMITH. JOHN TURNER.

At an Ordinary Meeting of the Royal Institute of British Architects, held on Monday, 18th May, 1857,

EARL DE GREY, K.G., President, in the Chair,

After the presentation of the Royal Gold Medal to Owen Jones, Esq., Fellow, and the other Medals and Prizes to the various recipients, W. Tite, Esq. M.P., Fellow, rose and addressed his Lordship to the following effect:—

Mr. Tite begged to address his Lordship, and in conjunction with his friend Mr. Cockerell, Professor of Architecture at the Royal Academy, to introduce Mr. Pennethorne to his Lordship's notice. Their object was to ask him to add the grace of his Lordship's eloquence and the honour of his position to the compliment, they desired to offer to their worthy colleague and fellow, Mr. Pennethorne. A compliment, which every one present would feel was well deserved, and which all were desirous of paying to him. There had been for a great many years in England an office of some importance, called the Surveyor-General, and this office was in effect held by their friend Mr. Pennethorne. Inigo Jones occupied that office in his day, whether by the same title he did not know, but in that capacity was engaged in rebuilding portions of Somerset House, and for doing so he received the sum of 8s. 4d. per day and £40. for house rent and the use of a clerk. (Loud laughter). Now, he hoped their friend Mr. Pennethorne had been better paid. (Renewed laughter). The portion of Somerset House erected by Inigo Jones was one of exceeding elegance. Its style had been repeated in the Strand front by Sir William Chambers, and again at Oxford; and there was an imitation of it in the Commercial Sale Rooms in Mincing Lane: but, wherever it had been repeated, it had always been deservedly admired for the simple elegance of its taste and the beauty of its building. It was destroyed, however, in order to make room for the great offices constructed by Sir William Chambers, which were begun in 1766. Sir William had been the favourite architect of George III. He was not an Englishman but a Swede, and his title was Swedish; and the patronage of the King and the Government enabled him to create these buildings, which were, to a certain extent, in an unfinished state, until their friend, Mr. Pennethorne, following Chambers, had the good fortune to finish them. It was for a very long time a reproach to us, that so fine a building should be left on the west side in an imperfect state. Now, however, the Goverment had taken the matter in hand, and placed its completion in the hands of a man of skill, judgment and taste. Mr. Pennethorne told him, that he came to London in 1820: and being a relation of Nash, very soon by his talent, energy, and attainments, assumed an important place in his office. [The noble Chairman—These are your statements, not his]. (Laughter). Nash succeeded J. Wyatt as Surveyor-General, and after that the appointment became a good deal broken up and deranged. Nash was certainly one of our boldest improvers, and although his style of architecture possessed anything but boldness, yet his style of dealing with the metropolis possessed a boldness, which we should do well in the present day to imitate. (Applause). To him and our excellent friend Mr. Pennethorne we owed the fine range of Carlton Terrace. There were many, who would recollect old Carlton House, and the idea of building a range of palaces there in its place was at once grand and effective. Many would also remember Old Swallow Street; and when they called to mind the magnificent street that now occupied its place, they would be able to appreciate the talent, and skill, and energy of Nash. In those days speculative builders scarcely existed as a class; and, but for the energy of Nash, the great improvement of Regent Street would never have been carried out. He did not say, that it was the finest piece of architecture in the world: but as a *tout ensemble*, no improvement in street architecture was of a better general character than that of Regent Street; and when we recollected what London was, the difficulties there were in the way, we should accord to Nash the highest approbation. When Nash became advanced in years, Mr. Pennethorne carried through most of his works; and since then, as architect to the Government, many

millions had been spent under his superintendence. He had also distinguished himself under the difficulties, that were inseparably connected with the profession. A part of the business of an architect, and a singular one it was, was that of arranging for the purchase of masses of property. He (Mr. Tite) had had a great deal to do in this way, both with Mr. Pennethorne and Mr. Hardwick: and in some cases it was a very difficult matter to preserve one's temper (a laugh) and to secure the good will and feeling of the large mass of the profession, as his friend Mr. Pennethorne had succeeded in doing. Mr. Pennethorne informed him that in the case of one improvement where £1,000,000. was involved the property resold at £200,000. That was in the main line of improvement in the east at Shoreditch: which fell from the hands of Nash to Mr. Pennethorne. It was a main line of improvement of the greatest possible importance, and, in addition to it were the Victoria and Battersea Parks, which were also highly creditable to the taste and skill of Mr. Pennethorne. The sum, these improvements had cost, was very considerable, and every one felt that the money had been expended usefully, economically, and gracefully. (Hear, hear). He could only have wished that the spirit, displayed in these improvements, had generally been kept in view and gone on with. It was one of the notions and misapprehensions of the day to say that new brooms sweep clean. Every new broom began sweeping away, but, unfortunately, it did not sweep over the right line of crossing. (Laughter). But a great deal of this was owing to changes in political appointments, which involved alteration in all these things, and which led to much inconvenience. This, however, might be considerably alleviated, if a more distinct and well-chosen plan, as in Paris, were followed out. He might refer to many other of Mr. Pennethorne's public works, but he would conclude by reading the proposition for the proposed testimonial to him. He (Mr. Tite) trusted that the Testimonial, which they wished his Lordship to present to him (a Gold Medal with the head of Chambers on the one side, and his great work on the reverse, subscribed for by individual members of the profession), would be deemed a fitting token of the sense entertained by his compeers of Mr. Pennethorne's completion of a great building, which was a credit to our metropolis, and of their sense also of his worth as a man and a gentleman. (Loud applause).

Mr. Tite then proceeded to read the letter, signed by seventy-five leading members of the profession, in which was communicated to Mr. Pennethorne the desire to convey to him this mark of consideration and respect. In concluding these few remarks, and in asking his Lordship to present to Mr. Pennethorne this medal, he begged to add that the subscribers desired to record their estimate of the abilities and the merits of their friend as an architect, and also their sense of his distinguished qualities as a gentleman and a man of honour. (Loud cheers).

Professor Cockerell—My Lord, the merits of my friend Mr. Pennethorne have been so well set before you by Mr. Tite, that it is not so much a matter of favour as a matter of justice, which is to be done to the honourable gentleman, who has been a most efficient officer of the public for so many years. (Cheers). I am, so to speak, of the family of my friend Mr. Pennethorne, at all events I belong to the same school with him. Mr. Nash was his master, Sir Robert Taylor was the master of Mr. Nash, and Sir Robert Taylor was the master of my father. And I rejoice to see Mr. Pennethorne here to-night as the representative of the school to which we both belong. (Cheers). Your Lordship may remember the difference of opinion as to the merits of Mr. Nash. He may have had his defects. But what a courageous man he was! And it should not be forgotten, that when persons of merit and position recommended the covering of Regent's Park with closely packed buildings, which would give to the Government a high rental, Mr. Nash advocated and effected the leaving the space clear as it now is: and the formation of Regent Street—a street of palaces and buildings such as we are not likely to get up again. (Cheers). It is to be regretted that we have not a proper biography of that eminent man, of whom I could tell you many curious traits. (Loud cheers). Now, my Lord, as a veteran in the profession, I must acknowledge to the fullest extent the claims of Mr. Pennethorne to your regard, and I can only regret that my friend Mr. Nash is not here, because, if he were, he would no doubt

imitate the habits of our friends in France, where, when a pupil is receiving his gold medal, he always goes to his master and embraces him. (Laughter). Nothing can be more graceful, gentlemen, than this custom; and I regret that Mr. Nash has not been spared for this occasion. (Cheers). My Lord, I have trespassed, I am afraid, too much upon your time, and I now beg leave to second the resolution. (Cheers). I may add that it is with extreme pleasure that I have seen my friend Mr. Owen Jones receive the gold medal on this occasion. We all know how fully it is due to him, and how much we owe him in our professional studies. (Loud cheers).

Mr. Mayhew.—My Lord, as the District Surveyor of Saint James's since the year 1832, I cannot help bearing testimony to the scientific knowledge and ability of Mr. Pennethorne in the works, which he has carried on in that parish, and particularly to his design for the Geological Museum. That was a very great work; it required great knowledge and skill: and I can only say that everything there, which was conducted by Mr. Pennethorne, redounded very highly to his credit. Feeling this, I cannot sit still without adding my testimony to the merit of Mr. Pennethorne. (Loud cheers.)

Earl de Grey.—It is almost lowering a memorial such as this to put it in my hands to present it, Mr. Pennethorne, to you. It is, however, offered to you by your professional brethren, who have more opportunities of knowing your abilities than I have. I am merely acting on their behalf. At the same time, it is a proud situation for one to be placed in, who is not a professional man, on an occasion like this. I have great pleasure in being the medium of presenting to you one of the most touching instances, that can be afforded, of the approval of the members of your profession. With regard to the reference made to your late relation, Mr. Nash, I may say, that it is now nearly thirty years, since I had first the gratification of being connected with him. I think it was in the year 1827, when the United Service Club was being built under his charge. He was the agent of the Crown, and I was a member of the Committee of that Club. We felt that with regard to the exterior of that great building, it being a part of Carlton Place and Waterloo Place, the external design should be left entirely to Mr. Nash. But, with reference to the interior, I cannot forget the kindness with which Mr. Nash received the observations made by the Committee. I, myself, suggested changes which Mr. Nash might not have approved, and I never met a man who allowed his projects to be modified by those, who were not professional, with greater forbearance and gentleness than by him. Mr. Pennethorne, I have great pleasure in presenting to you this testimonial, and I fully concur in the praises, which have bestowed upon your great work in the completion of Somerset House. (Cheers.) I have often wondered when and how it could be finished: and when I drove past it the other day on my return from Dover, I was very much struck by the beauty of the execution of the front, which you have added to it. (Cheers.) I have the greatest pleasure in being the instrument of conveying this medal to you. I have, myself, no right to offer it. It is given to you by your brethren—the gentlemen of your own profession, with a total want of anything like professional jealousy, doubt, or anxiety, and I can only say that I have the greatest pleasure in being called upon by them to be instrumental in paying you this compliment.

Mr. Pennethorne.—My Lord, I can only sincerely thank the Institute and the gentlemen present for the peculiar honour and great compliment they have conferred upon me, and if I spoke for an hour I could not say more. Nine months ago, I received, through my friend Mr. Angell, the first intimation of this compliment. I was totally unprepared for anything of the kind, and being fully conscious of my own imperfections, of which no man is more aware than myself, I was perfectly astonished at such an expression of kind regard; the more so as it has been my misfortune, owing to living in the country and other circumstances, not to associate with my professional brethren as others have done; nor to attend the meetings of this Institute. It came, therefore, with double force upon me, when I was told that my professional brethren did hold me in their esteem. And I never can cease to feel the utmost gratitude to the gentlemen, who signed the paper, which has been read. Much has been said to-night extremely complimentary to myself, but I should first like to say a few

words in reference to what has fallen from Professor Cockerell, Mr. Tite, and from the Noble Chairman, with regard particularly to the late Mr. Nash. After Mr. Nash's death, there were differences of opinion as to his merits. After a period, therefore, of thirty years to hear his works spoken of as they deserved, is to me most gratifying. Everybody in this room will acknowledge, that it was Mr. Nash in whom originated the spirit of improvement in architecture in this metropolis, which has since produced so many great works. And there are many young men in this room, who will in consequence carry architecture in this country to a greater degree of perfection than any other school in Europe. I believe that English architects, like English engineers and other classes of professional men, will become superior to those of any other country. The progress of architecture is already displayed by the works shewn in competition for the Constantinople Church, and by the Liverpool competition, as well as in that which is now upon view for the Public Offices at Westminster Hall. I am thankful to Mr. Tite and to Mr. Cockerell for giving to Mr. Nash that praise, which is his due. And I have to thank his Lordship for the very kind manner in which he also has spoken of him, as well as of myself. And I may be permitted to state, respecting the Museum of Economic Geology, which Mr. Mayhew has mentioned as having a good front, that the design was much benefited by his Lordship's suggestions, he having been consulted by Lord Carlisle on the subject. I was also under great obligations to his Lordship, as Lord Lieutenant of Ireland, when I was sent by the Government to that country. In reference to the buildings I have constructed, it is not for me to speak: but as respects Somerset House, my endeavour was to follow scrupulously the spirit of Sir William Chambers, and I felt it my duty to endeavour to carry out that building in the manner I supposed he would have done. I was compelled to put an attic story to it, which has been criticised; but it was one of the requirements of the establishment. If I should be employed hereafter on any public work, I can assure you, that the compliments which have been paid me to-night, will make me ten times more anxious to continue to merit the good opinion of my professional brethren. (Cheers.) With regard to the metropolitan improvements of which I had the controul for seventeen years, I am much gratified by the opinions, which have been expressed to-night. They have been, by Act of Parliament, transferred to the Metropolitan Board of Works, and hereafter I suppose all public improvements will be under their controul and management. Though that Board may not exist as at present constituted, it will in some form or other; and there is no man better qualified to carry out the great improvements required than the present architect of that Board. (Cheers.) I esteem most highly the expressions of goodwill from my friend, Mr. Tite; because there is no one in London, whom I have met more frequently adversely than him. (Cheers and laughter.) Yet there is no man, who has shewn more strong sense, better feeling, or more uprightness; or with whom I have had less difficulty in coming to conclusions than Mr. Tite. (Cheers.) I should like also to allude to my friend, Mr. Cockerell, who has spoken as being professionally of the same family as myself. I wish I could claim that in a nearer sense. When I was a young man going abroad, the then young Robert Cockerell had just returned from foreign travel with a high reputation. I was recommended by Mr. Nash to go to him, and by his urgent advice I paid more attention to the palaces and modern architecture of Italy than to the works of ancient art. Unfortunately, I did not go to Greece, and could not therefore there study Grecian art: though I consider it the purest and finest architecture in the world. What I did study I owe to Mr. Cockerell. (Cheers.) I fear that I have trespassed long upon your time, but this subject has dwelt for months upon my mind; it must be uppermost with me to the day of my death, and I cannot sufficiently express how strongly I have, and do feel it—and I again desire to return my thanks to every person in this room—to the Institute, who have added increased value to the medal by allowing it to be presented here; and to his Lordship, whose gracious manner has added very considerably to the honour, that has been conferred upon me. (Loud cheers.)

Mr. Pennethorne *holds two Appointments, being Architect to the Commissioners of Her Majesty's Works, and also to the Commissioners of Her Majesty's Woods.*

1820. Mr. Pennethorne, who is a native of the City of Worcester and came to London in February 1820, was educated for his professsion by the late Mr. Nash, and as his clerk, he then began to be known at the Office of Woods.

1828. Mr. Pennethorne, having returned from abroad, became Mr. Nash's principal Assistant, and in that capacity, was employed and entrusted to a great extent with the Strand Improvements, the building of Carlton House Terrace, the laying out of St. James's Park, and other Public Works, which required constant communication on his part with the Board of Woods.

1832. Mr. Pennethorne was first employed by the Commissioners of Woods as an independent professional man, and has ever since (now 24 years) been more or less employed by them.

1838. Mr. Pennethorne this year submitted to a Select Committee of the House of Commons Plans for the Improvement of the Metropolis, which were approved and recommended by them for adoption: whereupon he was appointed, in conjunction with Mr. Chawner, then one of the joint Architects of the Board of Woods, to prepare the necessary Plans and Estimates for carrying them out, Mr. Pennethorne being considered fully qualified by the experience he had obtained in such undertakings under Mr. Nash.

1839. In this year, the Plans and Estimates prepared by Mr. Pennethorne and Mr. Chawner were approved by a Committee of the House of Commons, an Act was passed to carry them into execution, and by the same Committee, in communication with Lord Duncannon, the then Chief Commissioner of Woods and Works, it was arranged, that Mr. Pennethorne and Mr. Chawner should be remunerated according to the agreement made with Mr. Nash for the Regent Street and other Improvements conducted by him.

1840. In June this year, Mr. Pennethorne was appointed joint Surveyor of Houses in the Land Revenue Department, in the place of Mr. Rhodes, who retired, at a salary of £100. per annum, and upon the other terms of remuneration settled in 1825; and upon this agreement Mr. Pennethorne has ever since continued to hold the appointment. From this year Mr. Pennethorne began to decline the private practice of his profession.

1843. In October of this year, Mr. Chawner retired, and Mr. Pennethorne has ever since continued to perform alone all the duties of Architect of Works and Surveyor to the Woods and Forests, upon an understanding with the Commissioners, that he should from that time entirely abandon his private practice.

1845. In December of this year, by Minute of the Treasury, Mr. Chawner was placed on the retired list of the Department with a retired allowance of £500. per annum, to take effect from Christmas 1843. By the same Minute, the Treasury desire it may be understood, that Mr. Pennethorne was not to be at liberty thereafter to engage in private professional business of any description, and that the retired allowance to be awarded him, when incapacitated for the public service, will have reference to the length of time engaged in the exclusive employment of Government, and to the other circumstances of his service. The appointment of joint Architects had been found to be productive of difficulties and dissension. On the return of Mr. Pennethorne from the Survey of the Workhouses in Ireland, early in 1844, he was given to understand that he would be continued as sole Architect, provided he conducted the very many and important increased duties which would from that time devolve upon the office; and upon this understanding, Mr. Pennethorne has performed the duties alone ever since October 1843, now 12½ years.

The Public Improvements upon which Mr. Pennethorne has been employed by the Board of Works (exclusive of the duties performed by him as Surveyor of Houses in the Land Revenue Department) have been the following:

1. The four lines of Metropolitan Improvements authorized by the Act 3 and 4 Vict., cap. 87, commenced in 1840, in conjunction with Mr. Chawner. The amount of property purchased for these lines was not less than £727,818; the total expenditure was not less than £1,000,000.; and properties were also let or sold of the value of not less than £200,000.
2. The Shoreditch Improvements, yet in hand.

3. The formation and laying out of Victoria Park. The properties purchased amounted to £87,298.; the total expenditure was £115,000.; and the Park was laid out entirely from the designs and under the superintendence of Mr. Pennethorne alone.
4. The formation and laying out of Battersea Park. The properties purchased amounted to £228,800.; the total expenditure to the present time has been £281,000.; and the laying out of the Park is now in a very advanced state, entirely from the designs and under the sole superintendence of Mr. Pennethorne.
5. All the Plans and Estimates preparatory to going to Parliament for the proposed Albert Park at Islington.
6. The formation of the Street from Lower Sloane Street to Chelsea Bridge, and the valuation of properties required for the Chelsea Embankment.
7. The Pimlico Improvement.
8. The laying out of the Kitchen Garden at Kensington for building purposes, letting all the lands and conducting the whole undertaking from the commencement to the end.
9. The Improvements of the Town of Windsor.
10. In addition to the above, Mr. Pennethorne, as Architect to the Commissioners for the Improvement of the Metropolis, made plans and valued properties, from 1844 to 1850, to an enormous extent. And also as arising out of these, made correct and detailed plans and schedules preparatory to going before Parliament, for the Victoria Park Approaches, the Southwark Improvement, the Covent Garden Improvement, the Carey Street Improvement, the Kennington Common Enclosure, and others.

The Public Buildings upon which Mr. Pennethorne has been employed since 1843, *have been:—*

1. The rebuilding of the Stables at Claremont, at a cost of £8,595.

1A. The Alteration of the Quadrant, Regent Street.

2. The Museum of Economic Geology in Piccadilly, at a cost of £29,572.
3. The Additions to the Ordnance Office in Pall Mall, at a cost of £20,165.
4. The General Record Repository in Fetter Lane, at a cost (including Fittings) of £78,606.
5. The New Stationery Office at Westminster, at a cost of £25,792.
6. The New West Wing of Somerset House, at a cost of £81,123.
7. The Additions to the Liverpool Post Office, at a cost of £13,120.
8. The Offices for the Council of the Duchy of Cornwall, at a cost of £9,609.
9. The South Wing of Buckingham Palace, at a cost of £77,655.

In addition to the above, Mr. Pennethorne was directed in 1849, to make elaborate Designs for an enlargement of the present National Gallery, by building over the whole site of the St. George's Barracks. Also in 1851, to make Designs for a new Gallery to be built upon a site in Kensington Gardens. Also in 1854, to make several elaborate Designs, to be laid before Parliament, for new Public Offices to be built in Downing Street; including a Model of the Building, and completely arranged finished Drawings of both exterior and interior of the portion thereof intended for the Foreign Office. In 1855, he was directed by the present Chief Commissioner of Works, to make finished Plans and Elevations, to be laid before Parliament, of new Public Offices for Downing Street, upon a site extending south all the way to Great George Street. And in December 1855, he was also employed to make Designs and Estimates for the new War Office then intended to be built in Pall Mall.

Among the Private Works, executed by Mr. Pennethorne between 1832 *and* 1840, *may be enumerated:—*

The Bazaar, St. James's Street, for William Crockford, Esq.
Christ Church, Albany Street.
Trinity Church, Gray's Inn Road.
Lamorby House (enlarged) and Chapel for John Malcolm, Esq.
Swithland Hall, Leicestershire, for Butler Danvers, Esq.
Dillington House, Ilminster, for John Lee Lee, Esq.
St. Julien's.—The Right Honourable J. C. Herries.
House at Newmarket for William Crockford, Esq.
The Design submitted by Mr. P. for the Royal Exchange was one of the five selected.

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